

356 1007 100

THE LONDON NATURALIST

The Journal of the
LONDON NATURAL HISTORY SOCIETY

No. 39 for 1959

PRICE TEN SHILLINGS

Date of publication : August 1960

LONDON NATURAL HISTORY SOCIETY

Founded 1858

Honorary President:

Prof. H. MUNRO FOX, F.R.S.

Honorary Vice-Presidents:

C. L. COLLENETTE, F.R.G.S., F.R.E.S.

Miss C. E. LONGFIELD, F.R.G.S., F.R.E.S., F.Z.S., M.B.O.U.

OLIVER G. PIKE, Hon. F.R.P.S.

J. ROSS, L. J. TREMAYNE

Officers for 1959

President: E. B. BANGERTER

Vice-Presidents:

P. W. E. CURRIE, F.R.E.S., J. H. G. PETERKEN, F.L.S.

R. C. HOMES, M.B.O.U., L. PARMENTER, F.R.E.S.

R. W. HALE, C. P. CASTELL, B.Sc., F.G.S.

Honorary Secretary: H. A. CRAW

Treasurer: V. F. HANCOCK, M.B.O.U.

General Secretary and Assistant Treasurer:

Mrs. L. M. P. SMALL, 13 Woodfield Crescent, W.5.

Librarian: J. B. FOSTER, B.A.

Curator: K. H. HYATT

Secretaries:

Advertisements—G. T. MESSERVY-WHITING

Minuting—Miss M. E. KENNEDY

Minuting for Council—Miss P. M. B. BROWN

Programme—Miss R. H. GRIFFITHS

Schools Liaison—Miss H. FRANKS

Transport—W. G. SMALL

Editor, London Naturalist—R. M. PAYNE

Joint Editors, London Bird Report—H. P. MEDHURST and J. L. F. PARSLOW

Members of Council:

L. Baker, G. Beven, M.D., B.Sc., F.Z.S., M.B.O.U., R. E. Butler, B.Sc., B. L. J. Byerley, F.R.E.S., J. L. Cloudsley-Thompson, M.A., Ph.D., F.L.S., F.R.E.S., S. Cramp, B.A., M.B.O.U., Miss R. Davis, Miss E. M. Goom, B.Sc., Miss N. Goom, F.L.A., D. G. Hall, J. E. Lousley, W. D. Park, R. C. Vernon, M.B.E.

Information about the Society may be obtained from the General Secretary:
Mrs. Small, 13 Woodfield Crescent, W.5.

YOUNG ZOOLOGISTS' CLUB

This is a Club for young people between the ages of 11 and 18, who are interested in the Zoo, in natural history and in animals generally. It is based on the London Zoo and Whipsnade Park and members receive free tickets to both menageries. There are lectures and films during the school holidays, a Club magazine, competitions and an information bureau. Subscription 10s. a year ; reduced rates for group membership of ten or more.

For further particulars please write to :

THE SECRETARY OF THE YOUNG ZOOLOGISTS' CLUB
THE ZOOLOGICAL SOCIETY OF LONDON
REGENT'S PARK, LONDON, N.W.1.

THE BOTANICAL SOCIETY OF THE BRITISH ISLES

Patroness: H.R.H. THE PRINCESS ROYAL

President: PROFESSOR T. G. TUTIN, M.A., F.L.S.

30s. a year - Ordinary Membership

15s. a year - Junior (*under 21*) Membership

PROSPECTUS AVAILABLE ON APPLICATION

MEMBERSHIP IS OPEN TO ALL INTERESTED
IN BRITISH BOTANY

All enquiries should be addressed to the Hon. General Secretary :

DR. J. G. DONY, 41 SOMERSET AVENUE, LUTON, BEDS.

THE AMATEUR ENTOMOLOGISTS' SOCIETY

The Society, now in its twenty-fifth year, has always specially catered for the Amateur and younger generation of Entomologists. All branches of the science are covered. Eleven Bulletins are produced annually containing articles and notes by specialists and especially contributions from members. A wide range of publications is available and more publications are added at intervals.

Other Advantages of Membership include :—

1. *Wants and Exchange List* published 4 times annually.
2. *Membership List with Geographical Index including Overseas Members.*
3. *Annual Exhibition in London.*
4. *Study Groups for Specialist Interests.*
5. *Field Meetings.*
6. *Affiliation to the Council for the Promotion of Field Studies.*
7. *Advisory Panel for identifying specimens and answering queries.*
8. *Moderate Subscription with reduced rates for Junior Members.*

Please write to :—

R. D. HILLIARD, 54 GYLES PARK, STANMORE, MIDDLESEX
enclosing 2d. stamp, for Prospectus and full details.

All enquiries for advertising space in

THE LONDON NATURALIST

should be addressed to :

G. T. MESSERVY-WHITING

4 Alexandra Mansions, S.W.3.

THE LONDON NATURALIST

No. 39 for the year 1959



CONTENTS

	PAGE
Council's Report	2
The Animal Life of Prehistoric London—C. P. Castell ..	5
Records of Fishes from the N.W. Kent Marshes—J. F. Burton ..	17
The "Common" Goby in the London Area—A. C. Wheeler ..	18
Further Records of Mammals, Reptiles and Amphibia in the London Area—R. S. R. Fitter	18
The Birds of a Cultivated Area on Epsom Common—D. A. Rook ..	22
The Ferns of Epping Forest—R. M. Payne	25
Further Notes on Relics of the Great North Wood—J. E. Lousley ..	31
Botanical Records for 1959—J. E. Lousley	36
*A Contribution to the Flora of Central London—D. H. Kent ..	41
*The Survey of Bookham Common : Eighteenth Year	
Progress Report	63
A Further List of the Diptera of Bookham Common—L. Parmenter	66
The Aquatic and Wasteland Plants of Bookham Common—A. W. Jones	76
Recent Changes in the Bird Population of Grassland with Encroaching Scrub at Bookham Common—W. D. Melluish	89
*A Supplement to the Butterflies and Moths of London and its Surroundings (Part II)—C. G. M. de Worms ..	99
Stane Street at Morden : 1959 Excavations—D. J. Turner ..	130
Obituary : L. J. Tremayne, C. L. Collenette ..	133
Books	138
Nature Conservation in the London Area—W. A. Macfadyen and P. A. Gay	142
Official Reports	144
Statement of Accounts	150
Sectional Reports	152

PLATES

1. *Thelypteris oreopteris* (Mountain Buckler Fern) growing near Loughton
2. *Thelypteris palustris* (Marsh Buckler Fern) growing near Epping
3. L. J. Tremayne, C. L. Collenette

Facing page 30

Facing page 31

Facing page 135

* *Reprints are available of these articles*

Council's Report for 1959

THE first year since the Society's Centenary has been marked by two developments of significance for the future.

Firstly, the new Administration and Finance Committee, mentioned in our last report, has come into being and has successfully conducted the routine business of the Society during the year, leaving Council free to consider policy and matters raised by the Sections. The Honorary Secretary is Secretary to Council while the General Secretary is responsible for the Administration and Finance Committee.

Secondly, at the request of some of the younger members led by Miss Muriel Park, Council approved the formation of a Young Naturalists' Section under the chairmanship of Mr. W. G. Teagle. Activities have already begun and the committee, with Miss Park as Secretary, has arranged a full programme of indoor and field meetings.

With its new emphasis on Sectional activities, Council has decided that its report to the A.G.M. should reflect to a greater extent the scientific work and natural history studies which are going on continuously in the Society. Some of the high-lights are outlined in the paragraphs which follow.

The Ornithology Section is going ahead with the Society's colour film *The Birds' Metropolis* and many feet of film have already been taken. The photographers, Mr. R. P. Cordero and Mr. W. D. Park, are always interested to learn of birds which can be photographed. The *London Bird Report* has had the misfortune to lose both its Joint Editors who were also Recorders for North and South of the Thames. Mr. D. I. M. Wallace, the new Editor, made great efforts to have the *Report* ready to publish with the Programme in January. The *Bulletin* of the Section continues to be issued but although it is interesting and well produced, it has not yet attracted the subscribers it deserves. The Section's ringing station at Beddington Sewage Farm has had another successful year and well over 2,000 birds of 63 species were ringed.

The eighteenth year of the Bookham Common Survey by the Ecology Section was marked by the gratifying recognition of its scientific value by the Nature Conservancy, which is declaring the Common an Area of Special Scientific Interest. Because of the exceptional amount of information on the changing flora and fauna made available by the Society's activities, the Nature Conservancy in collaboration with the National Trust, the Council for Nature's Conservation Corps and our own Society has chosen the Common for a pilot experiment on the control of the spread of scrub on common land.

The Mammal Study Group is planning a survey of London woods to record badgers and foxes, with the help of the Young Naturalists' Section.

The Botanists continue to amass information on the occurrence of plants, and the Recorders would still welcome additions to their extensive card index. The Botanical Records form a most interesting feature of the *London Naturalist*.

The Archaeology Section is tracing the course of Roman Roads in the area, a task not fully attempted before. Two parties are working on North and on South of the Thames respectively and the publication of their results has been planned. Members of the Section (incorrectly reported in the Press as the Southwark Natural History Society) helped Mr. Marsden

in his notable discovery of a Roman wooden boat during excavation of the site for the new Guy's Hospital.

The Entomology Section commenced its survey of the occurrence of Stag-beetles in the area and is also revising and improving its collections especially to help beginners. Publication is planned of a work on the Micro-lepidoptera now that the papers by Baron de Worms on the Macro-lepidoptera have been completed.

The Geology Section is forming a collection of photographs of historic and temporary sections and of other sites of geological interest. Photographs will also be included of places outside the Society's area visited by the Section on its popular Easter week-end excursions, which cater for the general naturalist as well as the geologist.

The South-West Middlesex Group is co-operating with the Curator of Gunnersbury Park Museum in the preparation of a leaflet about the trees in the park.

The Lower Wood Nature Sanctuary is now available to the sections for study. It will not be open for casual visiting, access being strictly limited to those working on specific tasks. Those who want to help should contact the appropriate sectional secretary. Mr. Peter Hayman has been appointed secretary of the Surveys Committee.

At the first Annual General Meeting of the Council for Nature, our Society's General Secretary was elected to the Executive Committee as Representative for the South-East region of England. She was proposed by our Council for election to this Committee.

The Society continues to co-operate with the University of London in planning courses of lectures of interest to our members, the subjects chosen for 1959-60 being Botany, Geology, Ornithology and Salt- and Fresh-water Biology.

Some of the Centenary Exhibition screens have been retained, renovated and slightly reduced in size for loan on request to other institutions and for our own use.

Council is grateful to the members who during the year have given books, specimens and photographs to the library and collections. There have also been valuable gifts of lantern slides and furniture, for which Council expresses thanks.

In spite of the large membership it is always difficult to find volunteers to fill the various posts essential for the efficient running of the Society. A letter appealing for volunteers for various jobs has been prepared for circulation and it is hoped that members will give the matter their earnest consideration.

The first year at the increased subscription rate has brought a not unexpected number of resignations. It is hoped that the present vigorous recruitment will continue and counter-balance the drop in membership. Council therefore urges every member to introduce at least one newcomer. The increase in the subscription has been well received by most members who have in general responded magnificently. As a result this year we can show a credit balance of £64 9s. 2d. and have also managed to replace some of the reserve capital that has been used over the last few years. This reserve is, however, not large, and we shall soon have to re-decorate our premises at Eccleston Square as well as provide further bookcases and improve the storage facilities.

Before membership figures are quoted it must be explained that the method of calculation has been changed. Hitherto all nominations

received before the A.G.M. have been counted as members, but for this and future years only those actually elected before the end of the Society's year (October 31) will be included as members. The drop in membership this year is thus made up of approximately two months' intake in addition to losses through raising the subscription.

We now have a membership of 1,564, of whom 1,126 are full members, 77 family members, 151 junior members, 20 junior family members, 161 country members, 4 country family members and 25 affiliated societies.

It has been decided that from the beginning of 1960, membership tickets will be issued by the General Secretary to those paid-up members who wish to have them, on receipt of a stamped addressed envelope.

Mr. Eric Hosking and Mr. Herman Spooner have been invited to become Honorary Vice-Presidents. Mr. Hosking, the eminent natural history photographer, is an ever-helpful member, and Mr. Spooner during his very long association with the Society has held many offices.

Miss B. Nicholson, one of the first four lady members elected in 1893, and Mr. E. Mann, who was joint librarian for many years, have been elected honorary members. Mr. S. Cramp has been proposed for election to one of the Vice-Presidential vacancies.

It is with the deepest regret that we record the deaths of two of our Honorary Vice-Presidents, Mr. L. J. Tremayne and Mr. C. L. Collenette. Obituary notices appear elsewhere in this issue. We also record with regret the deaths of the following members:—Miss B. Deans-Brown, Mr. H. A. Pettit and Dr. Malcolm Smith.

A Crest for the Society

It has been decided that the Society should adopt a crest or motif indicating in small compass its wide interests, for use on the Society's letter paper and publications. Ideas for such a crest are welcomed and, to encourage members, a book token will be awarded for the entry which best combines originality of design with effectiveness of presentation.

The entries, which will be judged by Council, should be received by the General Secretary not later than September 30, 1960. Size should not exceed a diameter of $1\frac{1}{2}$ inches and the design should be suitable for reproduction in black and white as well as in two colours.

Carnegie Bursaries

Carnegie Bursaries are available for members of this Society to assist with the cost of courses at Field Study Centres. Forms of application should be obtained when booking for the course. The General Secretary will complete the form for those members whose dues are fully paid.

The Animal Life of Prehistoric London

By C. P. CASTELL

(Presidential Address, December, 1958)

LAST year I dealt with the climate and vegetation of Prehistoric London, defining "Prehistoric" as the period of time between the first known appearance of man in this country and the first written historical records; that is, from early Palaeolithic times, some 600,000 years ago, when the Ice Age started in this country, until Roman times (Castell 1959).

The animal life of that period must now be considered. Fossil bones and teeth of mammals have been known from the London area for a long time. A little before 1690, a large flint hand axe, the first to be found in this country, and an elephant's tooth were found by a local pharmacist in gravel in Grays Inn Lane, "opposite to Black Mary's." The axe is in the British Museum and, in the British Museum (Natural History), there is a tooth of a Mammoth found in 1721 at a depth of 28 feet beneath the surface when a sewer was being dug along Pall Mall. The association of the flint implement with mammoth remains was easily explained by the 18th Century antiquarians by assuming it to be a weapon used by the Britons in attacking the elephants brought over by the army of the Emperor Claudius.

But it was not until 1813 that such apparently trivial and unimportant things as snails were noted in the brickearth of the Thames valley, when W. K. Trimmer gave an account of some mammal bones found at Brentford, although he merely dismisses the shells as "snail shells and shells of river fish" (Trimmer 1913). The first list of shells did not appear until 1838, when John Morris wrote on "deposits containing Carnivora and other Mammalia in the valley of the Thames" (Morris 1838).

Unfortunately, owing to the scarcity of their remains, very little appears to be known about animals other than mammals and molluscs.

We have seen (Castell 1959) that there were actually several Ice Ages or Glacial Periods, each separated by a warm Interglacial Period. During the greatest of these ice ages, the Maximum, Penultimate or Great Chalky Boulder Clay Glaciation, the great ice sheet spread from Scandinavia across the North Sea, covering the whole country to just north of the present Thames at London. It reached as far south as Epping, Finchley and Hendon, leaving behind a tough bluish-grey clay full of boulders as evidence. The Thames itself was pushed south and all life north of it must have been exterminated. We saw how evidence had recently been discovered of the freezing of the ground near Reading to a depth of some 200 feet during the last glaciation, when the ice did not extend further south than the Midlands and it was estimated that a January isotherm of about 5°F. and a July one of 45°F. passed through the London area. Few animals could have survived the far more severe conditions of the Maximum Glaciation,

During the Great, Holsteinian or Hoxnian Interglacial, which followed the Maximum Glaciation and lasted 200,000 years (250-450 thousand years ago), two of the Thames terraces were deposited: the Boyn Hill Terrace at about 100 feet above the present Thames and the Taplow Terrace at about 50 feet. Here we have the first evidence of life in London in Prehistoric Times.

THE BOYN HILL TERRACE

Plant remains are rare in the Boyn Hill Terrace deposits, but those found at West Hackney, Stoke Newington and Grays Thurrock indicated a temperate climate with a mild winter and a flora similar to that of to-day. Swanscombe, unfortunately, yielded no plants and we had to go to Clacton for further plant evidence. Here 135 species of plants were recorded, mostly living to-day, and indicating a temperate climate with a warmer and a drier summer than at present. Recent work has shown that, during the period represented by 18 feet of these deposits, a mixed oak forest was followed by an increase in coniferous trees, until, at the top, 70% of the pollen was of *Abies*, the Fir, indicating the approach of the next glaciation.

Two of the most famous localities for fossil mammals and molluscs in the Boyn Hill Terrace deposits are Swanscombe in Kent and Grays Thurrock in Essex, with an important outpost at Clacton. The age of the deposits is estimated at from 300 to 400 thousand years ago. (Kennard and Woodward, 1897; Hinton and Kennard, 1901; Abbott, 1909; Warren, 1923b; Kennard, 1924; King and Oakley, 1936; Wright, 1937; Oakley, 1952; Kurtén, 1959; Zeuner, 1959.)

The fauna is a mixture of species still living in England to-day and of many extinct or no longer living in this country. Among the species still living in Britain to-day may be mentioned: Shrew, Fox, Cat, Bank Vole, Field Vole, Water Vole, Long-tailed Field Mouse, Red Deer, Roe Deer, Grey Lag-Goose, Whooper Swan, Cormorant, Grass Snake, Frog, Toad, Pike, Roach, Dace, Rudd and probably Ruff and Eel.

On the other hand, there were also many animals no longer living in this country or even in Europe such as: a monkey, *Macacus pliocenicus*; Cave Bear, *Ursus spelaeus* at Swanscombe and *Ursus arctos*, the Brown Bear, at Grays; Cave Lion, *Panthera spelaea*; Cave Hyaena, *Crocuta crocuta spelaea* (the Hyaena is now confined to Africa); *Neomys browni*, a Water Shrew; Rhinoceroses—*Dicerorhinus mercki* and *D. hemitoechus*; the Horse, *Equus caballus*; *Hippopotamus amphibius*; the Boar, *Sus scrofa*; *Dama clactoniana*, closely allied to our Fallow Deer; Goat, *Capra* sp.; Ox, *Bos* sp.; *Bison priscus*; *Palaeoloxodon* (or *Elephas*) *antiquus* and *E. trogontherii*; The Beaver, *Castor fiber*, a giant extinct Beaver, *Trogontherium cuvieri* and the Voles, *Macrotus raticeps*, *Macrotus agrestoides* and *Arvicola praeceptor*.

NOTES ON SOME OF THE SPECIES

Macacus pliocenicus is known from one molar tooth from Grays. At present, *Macacus* is mostly an Asiatic genus, but one species, the so-called Barbary Ape, *Macacus innuus*, lives in the mountains of N.W. Africa, Morocco and Algeria and at Gibraltar and has been found fossil in S. France, N. Italy and in Switzerland.

Dicerorhinus mercki, the Broad Nosed Rhinoceros, was a great slender-limbed animal with a large horn, closely related to the only recent species, the Sumatran Rhinoceros, with a coat of hair and it is therefore assumed that *D. mercki* also had some kind of fur and its skin in folds. Zeuner considers it to have been a forest and parkland form. *D. hemitoechus*, the Narrow Nosed Rhinoceros, was a grassland form.

Bison priscus, The Steppe Bison. Zeuner thinks that this was probably merely a large long-horned race of the ordinary Bison, *Bison bonasus*, of to-day, which is a forest dwelling animal browsing on leaves and twigs

in parts of Lithuania and the Caucasus and not a grass feeder like the American Bison, *Bison bison*. Zeuner, however, considers *B. priscus* to have been a steppe form with a thick coat of hair similar to the winter coat of the Yak.

Palaeoloxodon antiquus, the Straight Tusked Elephant was the characteristic elephant of these beds. The tusks were almost straight and the molar teeth relatively small and simple in structure. It reached a gigantic size; one from Upnor near Chatham stood about 15 feet at the shoulder, the tallest African Elephant standing at about 11½ ft. An early form of Mammoth, *Elephas trogontherii* also occurred, but very rarely. Both of these elephants are considered to have been browsers rather than grazers.

Among the Mollusca were several interesting species now extinct in this country.

Corbicula fluminalis, a bivalved freshwater shell about an inch across, is perhaps the best known of the Pleistocene mollusca. The genus is extinct in Europe to-day, but there is no difference between English fossils and the species now living in the Euphrates and the Nile. Although a common fossil in England, it is rare in France and Germany and the reason remains a mystery.

Unio (Potomida) littoralis. This massive freshwater mussel, up to three inches long, lives to-day in rivers and streams in France, S. Europe, Asia Minor and N. Africa. With us, it is the commonest of our fossil freshwater mussels, but it is very rare in the Pleistocene of France and unknown from Germany.

Pisidium clessini (or *astartoides*) is a rather solid little bivalve, nearly half an inch long, with concentric grooves. It is extinct, but abundant in our Pleistocene, where it is frequently associated with *Corbicula fluminalis*. It is probably another Southern stream form, although it has not yet been recorded for the French Pleistocene.

Theodoxus cantianus is known only from the Swanscombe deposits. It is a pretty little shell, about half an inch long, rather like our living freshwater Nerite, *Theodoxus fluviatilis*. The striking black and white zigzag colour markings are usually still preserved in the fossil specimens. When first found in 1900, it was thought to be the living species, but a German expert identified it in 1903 with a much older Miocene fossil, *Neritina grateloupiana*. He changed his mind in 1914 and said it was *N. crenulatus*. But when specimens of *N. crenulatus* had been acquired by the British Museum after the 1914 war, this was found to be completely different, so the Swanscombe fossil was described as a new species, *cantianus* (Kennard and Woodward, 1924).

The late A. G. Davis opened up a small temporary pit near Swanscombe a few years ago and found it in great abundance. He considered it to be extremely like, and possibly identical with, *Theodoxus prevostianus*, which to-day lives in thermal waters in Hungary. He puts the interesting question "Are thermal waters the answer to the unique occurrence of *T. cantianus* at Swanscombe ?" (Davis 1953). Dr. Kerney has, however, recently pointed out to me its equally close resemblance to yet another species from E. Europe, *T. serratiliniformis*.

The little freshwater snail, *Belgrandia marginata*, is only 2mm high, but is an abundant and characteristic shell of the Pleistocene and is equally common in both the Boyn Hill and later Taplow Terrace deposits. It became extinct in this country during the Pleistocene, but still lives in France and Germany in clear spring waters.

Discus ruderatus, a small land snail about $\frac{1}{4}$ inch in diameter and prettily marked with numerous fine ribs, is a close ally of our common *Discus rotundatus*. It was abundant at Swanscombe and occurs at other Pleistocene sites, becoming extinct in the early Holocene in this country, although still living in the mountainous parts of Europe.

Sixteen species of Mollusca are extinct out of the 94 recorded at Swanscombe and 13 from the 100 at Clacton. It is clear that a large proportion of our mollusca were already living in the London area in Boyn Hill Terrace times.

At Swanscombe, the fauna of the earlier beds indicates that the Thames was bordered by woodlands, interspersed with grassland, the latter increasing later, as suggested by the appearance of Horse and Bison. At Clacton, the deposits and their flora indicate a warm temperate climate with mixed oak forest, but at the very top, coniferous trees become dominant, suggesting the oncoming of the next glaciation. Similarly, at Swanscombe evidence of cold conditions has been found near the top of the deposits, preceded by the appearance of the Lemming among the mammal fauna. Lemmings are rather like our Short-tailed Vole, but more heavily built and with a very short tail. To-day, they inhabit the Scandinavian mountains, Siberia and Arctic North America.

Lower Palaeolithic Man, evidence of whose existence has been found at Swanscombe and at Clacton, was a skilled hunter of large and fast moving game, using a wooden spear. One made of yew was found at Clacton and until recently was the only known wooden artifact of early Palaeolithic age. A few years ago, a complete yew-wood spear nearly eight feet long and with a fire-hardened point was found in Germany, within a skeleton of *Palaeoloxodon antiquus* and, scattered among the elephant bones, were about two dozen flint flakes used in skinning the animal. However, in those days the human population was sparse in the London area, as well as elsewhere, and man's hunting could have had little affect on the teeming local fauna.

THE TAPLOW TERRACE

We must now consider the fauna of the Taplow Terrace of the-Last Interglacial Age (150-250 thousand years ago).

There is little to learn from the rather poor flora from this deposit, except at Endsleigh Street near Euston. Here the flora was not very different from what we might expect in a marshy habitat to-day. Crayford yielded one piece of wood which might have been Sweet Chestnut but could equally have been Oak. The Endsleigh Street site yielded a large part of a skeleton of a Mammoth, with Red Deer, Horse and a small Vole (Hicks, 1892). The Mammoth from Gray's Inn came from the same terrace deposit; mammoth remains have also been found at Southall, Acton, Mitcham and many other places. One of the most famous sites on the Taplow Terrace was Crayford, the subject of a remarkably detailed account by A. S. Kennard which summarizes the results of some 50 years work (Kennard 1944).

This is perhaps a suitable point at which to digress in order to say a little about the three contemporary principal workers on the faunas of the Thames terrace deposits: B. B. Woodward, A. S. Kennard and M. A. C. Hinton, all amateurs studying the subject in their spare time.

B. B. Woodward (1853-1930) was the senior and pioneer worker on Quaternary mollusca in this country. So much confusion had been

caused by the quotation of old lists of shells, often misidentified, that Woodward critically examined all the available material of the Pleistocene and Holocene mollusca from the London district and published his results in 1890 (Woodward 1890). It was the first of several large and important papers dealing with various parts of the country. He was Librarian at the British Museum (Natural History) from 1881 to 1922, and his geological and molluscan studies were a spare time occupation.

A. S. Kennard (1870—1948) spent all his working life in a wholesale haberdasher's in London, working long hours with poor pay and short holidays. His first natural history interest was in the birds of North West Kent, but he soon took up the study of non-marine mollusca, and while still a young man, started to collaborate with Woodward. The second of the pioneer papers on the Quaternary non-marine mollusca of Britain dealing with Southern England was written jointly by Kennard and Woodward (Kennard and Woodward 1901) and for the next thirty years, until Woodward's death, a constant stream of papers appeared under their joint and separate authorship. Much of Kennard's work is hidden in supplementary reports in innumerable archaeological papers.

M. A. C. Hinton, the youngest of the trio and still living, was a lawyer. In 1899, at the age of 16, he read a paper on the deposits at Ilford which was published in 1900 (Hinton 1900) with contributions by Kennard and Woodward (Kennard and Woodward 1900); it still remains the standard account. He not only collaborated with Kennard in a geological study of the Thames Terraces (Hinton and Kennard 1901, 1905), but soon became an authority on Pleistocene mammals, especially the very difficult group of the Voles, Mice and Lemmings (Hinton 1910, 1926). In 1921 he accepted an offer to join the staff and to work on the Recent mammals at the British Museum (Natural History), where he became Keeper of Zoology from 1936 until his retirement in 1945.

These three amateur workers provided the foundation of our present knowledge of the fauna of the Quaternary deposits of the London area.

We must revert to Crayford and its famous Brickearth, which is believed to represent wind-blown material accumulated in very slow moving water. Kennard lists a large number of mammals including: Wolf, Fox, Bear, Lion, Hyaena, Horse, Bison, Wild Ox (*Bos taurus primigenius*), Red Deer, Straight Tusked Elephant (very rare), Mammoth (very common), Musk Ox, Woolly Rhinoceros, Suslik, Alpine Vole and Lemming.

NOTES ON THE SPECIES

The Mammoth, *Mammuthus* (or *Elephas*) *primigenius*, so characteristic of the Ice Age, represents the highest pitch of evolution attained by the elephants, being in some respects in advance even of the Indian Elephant. The teeth were extremely complex, with many ridges; their great size, and especially the height of the crown, gave them a prolonged period of wear, while the numerous alternating plates of enamel, dentine and cement, of different degrees of hardness, ensured that the grinding surface would remain sufficiently rough for the purpose throughout the period during which the tooth remained in use. The Mammoth was about the size of the Indian Elephant and by no means as large as the Straight Tusked Elephant, but with its enormous curved tusks and its thick coat of reddish fur it must have looked formidable to early man, probably its chief enemy. It differed from other elephants in its long and narrow skull, a hump over the shoulder and a strongly sloping back. Its remains

have been found all over Northern Europe, Asia and America, particularly in Siberia. Its extinction seems to have been a comparatively recent event. Kennard considers that it probably fed mostly on trees and shrubs, tree branches being essential for the wear of its teeth. In Siberia, its food was mainly fir cones and conifer branches varied with grasses, mosses and other plants. He states that it was not a steppe form, for it would have starved to death on the present-day steppes and it is doubtful if it could have survived the present-day English winter with heavy snow. The herds of mammoth at Crayford must have required an abundance of woodland or scrub for food. Zeuner considers the mammoth's molar to be the most efficient grinder among elephants and that it relied on the roughest food. It was adapted to the new periglacial type of environment, feeding on coarse low-growing vegetation and living frequently in a cold climate, with thick fur and other adaptations. One wonders if man compelled the mammoth to leave the more congenial scrub and forest and to retreat to the tundra to the North, where its efficient teeth enabled it to survive.

The Musk Ox (*Ovibos moschatus*) formerly had a wide distribution throughout the tundras of the old world, but is now confined to the northern barren grounds of North America and the unglaciated regions of North Greenland. It is a thoroughly arctic animal, avoiding wooded districts.

The Woolly Rhinoceros (*Coelodonta antiquitatis*) was very common at Crayford. Its remains are frequently associated with those of the mammoth. A carcase frozen in Siberia and another preserved in oil sands showed that there were no skin folds but a covering of dense black hair and also that there was an accumulation of fat over the shoulders as a food reserve. The horns were of unusual size and weight and the front one, which may have been used to clear snow from pasture, was on the very tip of the nose and slanted forwards.

The Suslik, Pouched Marmot or Gopher (*Citellus erythrogenoides*) is a burrowing animal inhabiting open and steppe-like districts where it lives in colonies. It occurs in Eastern Europe and Asia north of the Himalayas.

The Alpine Vole (*Microtus nivalis*) is to-day confined to the Alps and Pyrenees, where it lives near the snow line in burrows in the snow.

Birds are represented at Crayford only by rare remains of a species of Goose (*Anser* sp.) and some fragments of egg shells. The Frog is the only Amphibian and Pike the only fish, but Kennard remarks that, judging by the abundance of freshwater mussels, other fish must have been present, as the early stages of mussels are passed in the gills of fish. Kennard draws the following conclusions from the vertebrate fauna. It is a mixed fauna, including both woodland and open country species; all the species are well developed. Red Deer and Lion attain a gigantic size, which they certainly would not under the adverse conditions of a cold climate. He concludes that the climate was warm and temperate and probably warmer than to-day.

We must briefly consider the mollusca, of which 52 species were recorded, some in great abundance. Freshwater limpets, however, were very rare. They require a hard clean surface or floating vegetation for attachment. There are certainly few stones in the deposit and it would seem that there was little local aquatic vegetation. The extinct Freshwater Mussel (*Unio littoralis*) was common and the three living Swan Mussels

(*Anodonta cygnea*, *A. anatina* and *A. minima*) were also present but rare. The only common land snail was the little *Pupilla muscorum*, characteristic of dry grassland to-day.

Kennard concludes from his study of the mollusca, that the Crayford brickearth was deposited by a slow moving stream with but little aquatic vegetation and that the summer temperature was higher than to-day, with winters certainly not colder and probably warmer. Land mollusca are comparatively scarce compared with other Pleistocene deposits and he infers that there could have been little flooding of adjacent ground. There was a total absence of woodland forms, a contrast with Swanscombe, and few semi-aquatic species. The country was therefore probably open grassland with no marshes and but little aquatic vegetation.

He compares the mollusca of the British and North French Pleistocene. The land mollusca are practically identical, which one would expect if the Straits of Dover had not yet been cut through. But such a land bridge would form a barrier to freshwater forms and many of the aquatic species are absent in France, although all are in the German Pleistocene. He explains this by postulating that the Thames and Rhine were connected in early Pleistocene times but the French rivers drained into the Channel and were never part of the Thames-Rhine system. The break between the Rhine and the Thames probably occurred at the end of Boyn Hill Terrace times, for at Clacton the uppermost beds are marine.

Before leaving the Taplow Terrace, a few words must be said about the gravels and loams at Ilford, which have yielded a wonderful collection of mammals (Hinton and Kennard 1900). Unfortunately the exact age is still uncertain. Rolfe (1958) in a recent paper suggests that the deposits are not later in age than the earlier part of the Last Interglacial. The fauna is not unlike those we have already considered: Wolf, Fox, Wild Ox, Bison and Red Deer are all abundant; Horse and Mammoth are common; the Woolly Rhinoceros was rare but the other species were abundant; Beaver, Water Vole and a Field Vole (*Microtus arvalis*) are also recorded. Birds are again very rare, only Duck, Goose, and the Wandering Albatross (*Diomedea exulans*) having been recorded, while Pike is the only fish.

Forty-six species of Mollusca have been listed (Kennard and Woodward 1900) and five of these are extinct in this country, including a land snail *Fruticicola fruticum* and the aquatic species *Belgrandia marginata*, *Unio littoralis*, *Corbicula fluminalis* and *Pisidium clessini*. *Fruticicola fruticum* is a land snail about $\frac{3}{4}$ inch in diameter and known as a native species only from the Crag and Pleistocene. Ilford is the only locality for the species in the London area. It now lives in Germany and Austria, in hedgerows, but is widespread across Central Asia to Manchuria and in N. Africa.

FLOOD PLAIN TERRACE

We now come to the lowest and youngest of our Terrace deposits, which form the Flood Plain Terrace at about 25 feet above river level. In age, they range through the Last Interglacial, the Last Glacial into the Post Glacial, i.e. up to about 10,000 years ago.

Last year, the lake deposit at Twickenham was mentioned; this yielded plants, only one of which is not in our Society's own Plant List to-day (Leeson and Laffan 1894). The Admiralty site produced Dwarf Birch, indicating the onset of colder conditions (Abbott 1892). In these

deposits occur most of the earlier Pleistocene mammals, including *Hippopotamus*, but new arrivals are the Saiga Antelope, the unique frontlet and horn-cores of which are now in the British Museum, and the Reindeer, which became so abundant as to give the name of Reindeer Age to this period.

Hippopotamus amphibius is restricted to Africa to-day, but ranged over Europe and Asia in the Pleistocene. The form found commonly fossil in Europe and in this country was of great size and larger than that living. It certainly could not have withstood cold winters and as the living form has a stomach 11 feet long with a capacity of 5-6 bushels, it is evident that vegetation must have abounded in the Thames Valley, when these deposits were laid down, even if plant remains are so scarce.

The Saiga (*Saiga tartarica*), that curious ungainly bloated-nosed antelope, is now confined to the steppe of South Russia and S.W. Siberia and is known from the Pleistocene of Hungary, Belgium and the south of France where it was abundant, as well as from the solitary example from Twickenham. In the summer, the Saiga to-day wanders as far north as the Reindeer territory.

Reindeer or Caribou (*Rangifer tarandus*) are characteristic of the arctic tundra and subarctic so-called woods of low and scattered trees of both East and West Hemispheres.

These new arrivals provide evidence of a change from temperate interglacial to much cooler steppe and tundra conditions, possibly of the Last Glacial Period.

We considered in detail, last year, the Arctic Beds of the Ponders End Stage of the Lea Valley deposits and the interesting sequence of floras. We saw that the climate was probably comparable with that of Lapland to-day, with a July isotherm of 45°-50°F and with tundra conditions in the Thames Valley and ice sheets some 100 miles or so to the north. Mammoth, Woolly Rhinoceros and Reindeer were abundant, accompanied by Horse, Lemming and Bison. Not infrequently, considerable portions of the skeletons of two or three lemmings were found together in little balls of blackish material and Warren thought these little masses of bones were disgorged pellets of owls.

A very rich molluscan fauna was analysed by Kennard, and in 1912 he was able easily to recognize two groups: one, all boreal species and the other, species with a wide distribution but here all dwarfed, clearly indicating unfavourable conditions, presumably a low temperature. A number of the species, abundantly present in interglacial deposits and common to-day, are absent. Over 12,000 specimens were collected by Warren and identified and listed by Kennard in over 60 species for Warren's final report in 1952. Unfortunately, Kennard died before analysing the list and drawing any further conclusions (Warren 1912, 1916, 1923a; Allison, Godwin and Warren 1952; Hayward, 1958).

A very interesting find was made in 1890, when a large number of freshwater mussels were dredged from the gravelly bed of the Thames at Mortlake; further dredging produced more in 1900 (Jackson and Kennard 1909; Kennard and Woodward 1913). The mussels were very large and massive, mostly about six inches long, very well preserved with the periostracum or "epidermis" and hinge ligament intact. The shells were all covered with a deposit, up to half an inch thick, of calcium carbonate, which also concreted the gravel. The Thames must then have been a much faster flowing river than it is now, for the mussel was

Margaritifera auricularia, extinct in Britain, but still living though rare in quick-flowing and clear rivers in the Gironde and in Spain. The shells at Mortlake were associated with Neolithic implements and as this was the only known site in this country, it was suggested that they may have been introduced as food by Neolithic man from the continent. However, any doubt as to the native status of this London shell was removed in 1957 as a result of excavations in the Flood Plain Terrace deposits at Trafalgar Square, which produced the Water Chestnut referred to last year. The mammal fauna included the usual species such as Hippopotamus, Straight Tusked Elephant, Rhinoceros, Wild Ox, Red Deer, Fallow Deer and Lion. Some 13,000 shells of 60 species were collected and they included not only the usual abundant freshwater mussel, *Unio littoralis*, but a few specimens of *Margaritifera auricularia*. The aquatic snails included *Belgrandia marginata* and showed that the Thames was a warm swiftly-flowing highly calcareous river a hundred thousand years ago, as it was less than ten thousand years ago in Neolithic times. The land snails from Trafalgar Square were mostly of species living in marshy places near the river and partly dry-grassland forms, indicating that the surrounding country was fairly open and not densely forested. Well-preserved beetle remains were also found, but have yet to be studied (Franks and others 1958; Kerney 1958).

We saw, last year, that bones of land mammals and masses of peat were brought up by trawlers from the Dogger Bank, parts of which are now 170 feet below sea-level, the result of the melting of the Pleistocene ice sheets (Whitehead and Goodchild 1909; Whitehead 1920). These bones were of Bear, Wolf, Hyaena, Giant Irish Deer, Reindeer, Red Deer, Wild Ox, Bison, Horse, Woolly Rhinoceros, Mammoth and Beaver. The British Isles at that time were united to the rest of Europe across the North Sea and the Channel, the bridge across which the Post-Glacial fauna and flora reached England and the London area. The final opening of the Straits of Dover and the isolation of this country from the continent took place about 7,000 years ago.

HOLOCENE

There is a great deal to be found out about the fauna and flora of our area during the Post-Glacial or Holocene, i.e. the last 10 to 20 thousand years. Little appears to have been published and is scattered in various scientific, especially archaeological journals. More is known about the mollusca than perhaps any other group of animals (Kennard 1923). A few examples may be quoted.

The remains of Beaver were remarkably abundant in a Neolithic peat deposit found during the construction of the Walthamstow Reservoirs. The peat was considered evidence of a marshy fenland formed as a result of the drowning of forest through the action of numerous beaver dams.

At Colley Hill, Reigate, in 1898, mollusca were carefully collected at varying depths down to four feet in a deposit containing a Neolithic scraper at 2 ft. 6 ins. The so-called Roman Snail, *Helix pomatia*, occurred at intervals down to a depth of 3 ft. 6 ins, but the Garden Snail, *Helix aspersa* was found only at 9 ins. and 10½ ins. depth. Several species not known to occur in this part of Surrey to-day were found (e.g. *Arianta arbustorum* and *Ena montana*) and the fauna pointed to damper conditions in Neolithic times (Bullen 1899).

Going a little outside our area, to Cuxton near Rochester, an early Neolithic interment was investigated in 1907. The body had been covered with a layer, a foot or more thick, of flints and then covered with chalk. There was, in 1907, three feet of soil above the chalk. A large number of snails were found among the flints, which appear to have formed a snail shelter until the chalk was placed on top. Carnivorous species were very common. Four species of snails, very abundant in that district to-day, were absent among the flints; they were the Garden Snail, *Helix aspersa* and *Monacha cantiana*, *Helicella caperata* and *H. virgata* (Kennard 1909).

Somewhat similar results were obtained by Davis and Kerney with a Pre-Roman, and probably Neolithic, rainwash at the Oxted lime-works in Surrey. The fauna of 39 species of snails was that of a damp beech woodland and scrub area. Less than half the species still live in the vicinity and some such as *Ena montana*, *Helicodonta obvoluta* and *Abida secale* are either extinct in Surrey and Kent or very doubtfully recorded living. Others which now live near the site were absent from the deposit, including *Helix pomatia*, *H. aspersa*, *Monacha cantiana*, *Helicella virgata*, *H. caperata* and *H. gigaxi* (Davis 1953; Kerney 1957). During the construction of the Tottenham Hale Reservoirs about 1900, a Bronze Age dug-out canoe was found and in the same deposit bones of Fox, Dog or Wolf, Wild Ox, Bison, Goat, Horse, Sheep, Pig, Elk, Roe-, Fallow-, Red-, Irish-, and Rein-Deer and Beaver and over 50 species of mollusca. A similar series of mammals were found in the Neolithic peat at Walthamstow.

A Pre-Roman chalk rainwash at Cudham, Kent yielded a woodland-type fauna which indicated a climate much wetter than at present. The snails, *Acme fusca*, *Helicigona lapicida* and *Arianta arbustorum* no longer live in the vicinity—the local woodlands are now too dry to support them. On the other hand *Helix aspersa*, *Monacha cantiana*, *Helicella virgata* and *H. caperata* were absent, although now living nearby. Common Shrew, Bank Vole, and Long-Tailed Field Mouse were present (Kerney and Carreck 1954).

At Bermondsey in 1903, Pre-Roman marsh clay yielded 23 species of mollusca (mainly land snails) and one tooth of a Bank Vole. Roman silt produced nearly 40 species of mollusca as well as remains of Eel, Roach and Frog (Kennard and Warren 1903).

The Garden Snail, *Helix aspersa*, was not uncommon throughout a Roman layer at London Wall and the snails were seen *in situ* on the wall, apparently killed by a severe winter while hibernating fifteen hundred years ago (Kennard and Woodward 1902; Kennard 1929).

Snails were found near the base of a deposit at Keston, Kent, with a piece of Roman tile at the base. The Garden Snail was present but here again *Helicella caperata*, *H. gigaxi* and *H. virgata* were all absent yet living abundantly nearby. Further work yielded more mollusca and bones of Field Vole and Long-Tailed Field Mouse. The molluscan fauna suggested that in Roman times more woodland was present than now (Davis and Carreck 1951, Kerney and Carreck 1954).

These examples will show that it is only by careful collecting and investigation of the plant and animal remains of such deposits that it will be possible to work out the history of the flora and fauna of our area. At the same time, the plants and animals themselves will provide us, as we have already seen, with clues to past climate and environment. Mollusca are particularly useful for this purpose. A much more satisfactory

answer to the question of the origin and history of our flora and fauna will be found by these means than by any amount of armchair theorizing based on present-day distributions.

SUMMARY

In the London Area, little appears to be known about animal life other than mammals and molluscs and much of our present knowledge of these depends on the pioneer amateur work of Woodward, Kennard and Hinton. Except for the last glaciation, we know nothing of the fauna, which may perhaps have persisted during the glacial periods. Both the Great and the Last Interglacials were warm, and the faunas included a large proportion of the species now living in the area and many exotic species. In the Great Interglacial, we find Monkey, Lion, Hyaena, Rhinoceros, Hippopotamus and Elephants. Some of the molluscs now live only in South Europe and North Africa. A sparse human population was beginning to hunt the larger mammals.

The Last Interglacial was not quite so warm as its predecessor and the deposits link the interglacial with the following Last Glacial. The Mammoth, Musk Ox, Woolly Rhinoceros, Saiga Antelope and Reindeer appeared. The Straits of Dover had not yet been cut through and the highly calcareous Thames flowed swiftly for many thousands of years into the Rhine across the site of the present North Sea. Towards the end of the Last Glaciation, Mammoth, Woolly Rhinoceros, Reindeer and Lemming were still living in the Lea Valley.

In early Post-Glacial times, 7,000 years ago, the Straits of Dover were opened to the North Sea and England became isolated from the rest of Europe. Beavers were abundant in the Lea Valley in Neolithic times. Some snails, such as the "Roman" Snail, have been proved to be living here in the Neolithic, but the Garden Snail was not known until Roman times. Other snails point to damper woodland conditions in the Neolithic the woodland species being now extinct or very rare in the area and replaced in Post-Roman times by new-comers, species now common and characteristic of drier grassland.

REFERENCES

ABBOTT, W. J. L., 1892, The Sections Exposed in the Foundations of the New Admiralty Offices. *Proc. Geol. Ass.*, 12, 346.

—, 1909, The Pleistocene Vertebrates of South East England. *South Eastern Nat.* for 1908, 96.

ALLISON, J., GODWIN, H. and WARREN, S. H., 1952, Late Glacial Deposits at Nazeing, the Lea Valley, North London. *Phil. Trans.*, B., 236, 169.

BULLEN, R. A., 1899, Holocene Land-shells from Reigate. *Proc. Malac. Soc.*, 3, 326.

CASTELL, C. P., 1959, The Climate and Vegetation of the London Area in Prehistoric Times. *Lond. Nat.*, 38, 6.

DAVIS, A. G., 1953, On the Geological History of some of our Snails, Illustrated by some Pleistocene and Holocene Deposits in Kent and Surrey. *Journ. Conch.*, 23, 355.

—, and CARRECK, J. N., 1951, Note on Rainwash at Blackness Lane, Keston. *Lond. Nat.*, 30, 36.

FRANKS, J. W., and others, 1958, Haunt of Elephant and Rhinoceros: The Trafalgar Square of 100,000 years ago—New Discoveries. *Ill. Lond. News*, 232, 1011.

HICKS, H., 1892, On the Discovery of Mammoth and other Remains in Endsleigh Street. *Quart. J. Geol. Soc.*, 48, 453.

HAYWARD, J. F., 1958, The Mollusca Sequence in the Lea Valley. *Journ. Conch.*, 24, 239.

HINTON, M. A. C., 1900, The Pleistocene Deposits of the Ilford and Wanstead District. *Proc. Geol. Ass.*, 16, 271.

—, 1910, A preliminary Account of the British Fossil Voles and Lemmings; with Some Remarks on the Pleistocene Climate and Geography. *Proc. Geol. Ass.*, 21, 489.

—, 1926, *Monograph of the Voles and Lemmings (Microtinae), living and extinct*. Vol. I. London.

—, and KENNARD, A. S., 1901, Contributions to the Pleistocene Geology of the Thames Valley. I. The Grays Thurrock Area. *Essex. Nat.*, 11, 336.

—, and KENNARD, A. S., 1905, The relative ages of the stone implements of the lower Thames Valley. *Proc. Geol. Ass.*, 19, 76.

JACKSON, J. W. and KENNARD, A. S., 1909, On the former occurrence of *Unio (Margaritana) margaritifer* Linné in the River Thames. *Journ. Conch.*, 12, 321.

KENNARD, A. S., 1909, Non marine Mollusca from a early Neolithic Interment at Cuxton, Kent. *Proc. Malac. Soc.*, 8, 375.

_____, 1923, The Holocene Non-Marine Mollusca of England. *Proc. Malac. Soc.*, 15, 241.

_____, 1924, The Pleistocene Mollusca of England, *Proc. Malac. Soc.*, 16, 84.

_____, 1929, The Land Mollusca of Kent. *Journ. Conch.*, 18, 276.

_____, 1944, The Crayford Brickearths. *Proc. Geol. Ass.*, 55, 121.

_____, and WARREN, S. H., 1903, On a Section of the Thames Alluvium in Bermondsey. *Geol. Mag.*, Dec. 4, 10, 456.

_____, and WOODWARD, B., 1897, The Post Pliocene Non-Marine Mollusca of Essex. *Essex Nat.*, 10, 87.

_____, _____, 1900, The Pleistocene Non-Marine Mollusca of Ilford. *Proc. Geol. Ass.*, 16, 282.

_____, _____, 1901, The Post Pliocene Mollusca of S. England. *Proc. Geol. Ass.*, 17, 213.

_____, _____, 1902, Holocene Mollusca of London Wall and Westminster. *Proc. Malac. Soc.*, 5, 180.

_____, _____, 1913, Non Marine Mollusca from the old bed of the Thames at Barn Elms with *Margaritana (Pseudunio) auricularia* (Speng.). *Proc. Malac. Soc.*, 10, 332.

_____, _____, 1924, Nomenclatorial Notes relating to British non-marine Mollusca, III. With descriptions of *Theodoxus cantianus*, n. sp., and *Unio cantianus*. *Proc. Malac. Soc.*, 16, 130.

KERNEY, M. P., 1957, *Lauria sempronii* (Charpentier) in the English Holocene. *Journ. Conch.*, 24, 183.

_____, 1958, On the Occurrence of *Margaritifera auricularia* (Spengler) in the English Pleistocene. *Journ. Conch.*, 24, 250.

_____, and CARRECK, J. N., 1954, Notes on some Holocene Chalk Rainwashes at Cudham and Keston near Downe, Kent. *Proc. Geol. Ass.*, 65, 340.

KING, W. B. R. and OAKLEY, K. P., 1936, The Pleistocene Succession in the Lower parts of the Thames Valley. *Proc. Prehist. Soc.*, 2, 52.

KURTEN, B., 1959, On the Bears of the Holsteinian Interglacial. *Acta Univ. Stockholm. Stockholm Contributions in Geology*, 2, no. 5.

LEESON, J. R. and LAFFAN, G. B., 1894, On the Geology of the Pleistocene Deposits in the Valley of the Thames at Twickenham. *Quart. J. Geol. Soc.*, 50, 453.

MORRIS, J., 1838, On the Deposits containing Carnivora and other Mammalia in the Valley of the Thames. *Mag. Nat. Hist.*, Ser. 2, 2, 539.

OAKLEY, K. P., 1952, Swanscombe Man. *Proc. Geol. Ass.*, 63, 271.

ROLFE, W. D. I., 1958, A Recent Temporary Section through Pleistocene Deposits at Ilford. *Essex Nat.*, 30, 93.

TRIMMER, W. K., 1813, An account of some organic remains found near Brentford, Middlesex. *Phil. Trans.*, 131.

WARREN, S. H., 1912, On a Late Glacial Stage in the Valley of the River Lea, subsequent to the Epoch of the River-Drift Man. *Quart. J. Geol. Soc.*, 68, 213.

_____, 1916, Further Observations on the Late-glacial stage of the Lea Valley. *Quart. J. Geol. Soc.*, 71, 164.

_____, 1923a, The Late-glacial Stage of the Lea Valley (Third Report). *Quart. J. Geol. Soc.*, 79, 603.

_____, 1923b, The *Elephas antiquus* bed at Clacton-on-Sea and its flora and fauna. *Quart. J. Geol. Soc.*, 79, 606.

WHITEHEAD, H., 1920, More about "Moorlog," a Peaty Deposit from the Dogger Bank in the North Sea. *Essex Nat.*, 19, 242.

_____, and GOODCHILD, H. H., 1909. Some notes on "Moorlog," a peaty deposit from the Dogger Bank in the North Sea. *Essex Nat.*, 16, 51.

WOODWARD, B. B., 1890, On the Pleistocene (Non-Marine) Mollusca of the London District. *Proc. Geol. Ass.*, 11, 335.

WRIGHT, W. B., 1937, *The Quaternary Ice Age*. London.

ZEUNER, F. E., 1959, *The Pleistocene Period. Its Climate, Chronology and Faunal Succession*. 2nd Ed. London.

Records of Fishes from the N.W. Kent Marshes

By J. F. BURTON

THESE notes are intended to supplement those given for the Thames Marshes by A. C. Wheeler (1957) in his excellent and timely paper on the distribution of fish in the London Area. They are based on personal observation, mainly from watching the efforts of local anglers and by engaging them in conversation.

Habitats suitable for fish on the marshes consist for the most part of drainage dykes and ditches, and narrow fleets, but small pools are found on saltings from Crayford to Swanscombe. Flooded clay-pits and gravel pits are important at Dartford and Stone Marshes but in 1959 some of these had been filled in or were in the process of being so.

COMMON GOBY. *Gobius minutus* Gmelin.

P. W. Horn (1921) reported the Common Goby to be frequent in the salting pools and "rills" on West Thurrock Marshes, Essex, just across the Thames from the Kent marshes at Stone and Swanscombe. In 1953, D. F. Owen and I investigated the salting pools and gutters at Dartford and Stone Marshes on 1st March, but failed to discover any examples of this fish.

PIKE. *Esox lucius* (L.)

I have seen a few specimens captured by fishermen in the lakes on Stone Marshes during the years 1950-56 and am told it is frequent there.

CARP. *Cyprinus carpio* (L.)

Frequent in the lakes on Stone Marshes 1950-56.

ROACH. *Rutilus rutilus* (L.)

Numerous between 1950 and 1956 in at least one lake on Stone Marshes.

RUDD. *Scardinius erythrophthalmus* (L.)

During 1950-56 was reported by anglers as common in all the lakes at Stone Marshes except one where Roach occur. I have seen them taken from the flooded clay-pits at Cotton Farm.

EEL. *Anguilla anguilla* (L.)

Common in the fleets, dykes and ditches of all the marshes from Plumstead to Swanscombe. They are regularly fished for on Stone Marshes.

PERCH. *Perca fluviatilis* (L.)

Frequent in the flooded clay- and gravel-pits at Dartford and Stone Marshes.

BULLHEAD. *Cottus gobio* (L.)

D. F. Owen and I found one dead on 1st March, 1953, in a ditch on reclaimed marsh at Dartford which had been swelled with flood water following the severe breaches in the river walls caused by the notorious high tide of the night of 31st January-1st February, 1953. It is probably quite common in the fleets and streams on the Dartford and Stone Marshes.

THREE-SPINED STICKLEBACK. *Gasterosteus aculeatus* (L.)

Common in the fleets and dykes of all the marshes from Plumstead to Swanscombe. During 1953, D. F. Owen and I investigated the stickleback populations on the marshes at Abbey Wood, Dartford and Stone. We found the Ten-spined (*Pygosteus pungitius*) to be much

commoner than the Three-spined, the ratio 3 : 1 being a fair approximation of their relative abundance.

TEN-SPINED STICKLEBACK. *Pygosteus pungitius* (L.)

Very common on the Thames-side marshes from Plumstead to Stone (see notes under previous species).

REFERENCES

HORN, P. W., 1921, The Birds of West Thurrock Marsh. *Essex Nat.*, 19, 262-66.
WHEELER, A. C., 1957, The Fishes of the London Area. *Lond. Nat.*, 37, 80-101.

The "Common" Goby in the London Area

By ALWYNE C. WHEELER

AT the time of writing my paper on the fishes of the London Area I believed that the "Common" Goby did occur here, but lacking any positive record, such as J. F. Burton has cited, I omitted to mention it. K. H. Hyatt has since told me of gobies collected on Higham Marsh, Kent (actually just outside the area) in October, 1949, and has loaned me two specimens he preserved. These prove to be not *Gobius minutus* Gmelin but *Gobius microps* Krøyer, a species which has been repeatedly confused by British workers with *G. minutus*. *Gobius microps* occurs in the shallow water of salttings, marshes and particularly in estuarine conditions; I have captured it at a number of places on the Essex coast (Leigh-on-Sea, Burnham-on-Crouch, near Brightlingsea, and Skippers Island). *Gobius minutus* (in the strict sense) is a rather deeper water fish, sub-littoral in its habits. It seems unlikely that it would occur in the London area, although it is very common in parts of the Thames Estuary.

I would suggest that all records of gobies in our area, and in the littoral areas of the Kent and Essex coasts, will prove to refer to *Gobius microps*, but I would welcome any specimens to verify this conjecture.

Further Records of Mammals, Reptiles and Amphibia in the London Area

By R. S. R. FITTER

THIS paper summarises the records contributed by members of the Society between the publication of my Check-List (Fitter, 1949) and its supplement (Fitter, 1950), and my relinquishment of the Recordership of Mammals, Reptiles and Amphibia in 1956.

I thank the following observers for their notes: C. J. Armour, A. H. Betts, G. Beven, H. A. Bilby, F. H. Bourne, J. F. Burton, B. Coleman, D. M. Edwards, A. Gibbs, A. S. Haywood, J. F. Holloway, J. H. D. Hooper, G. E. Manser, E. Milne-Redhead, H. Murray, W. D. Park, L. Parmenter, Mrs. R. E. Parslow, R. W. Payne, E. G. Pedler, J. W. Peppitt, B. P. Pickess, R. G. Rigden, B. L. Sage, S. H. Singleton, V. Stanyon, N. F. Stewart, W. G. Teagle, A. V. Tucker.

MAMMALIA

INSECTIVORA

Hedgehog *Erinaceus europaeus*

Several records from the London parks: Regent's Park, one in a garden in the Inner Circle, April 2, 1956 (W.G.T.); Greenwich Park, one dead in the Wilderness, March 27, 1954, and one alive on June 22, 1954 (R.E.P.); Barn Elms Reservoirs, Surrey, one dead on May 18, 1950 (W.G.T.).

Mole *Talpa europaea*

Occurs near Lesnes Abbey, Woolwich, 1955-56 (R.G.R.).

Pigmy Shrew *Sorex minutus*

Additional records from Grove Park, Kent, Sept. 19, 1949, and Oct. 15, 1950 (G.B.), and London Airport, Middlesex, July 28, 1955 (H.A.B.); also a pair of mandibles believed to be of this species in an owl pellet at Lullingstone Park, Kent, 1952 (D.M.E.).

Water Shrew *Neomys fodiens*

Cuffley Great Wood, Herts, one entering a hole in the bank of Grimes Brook, May 16, 1951 (B.L.S.). Plumstead Marshes, Kent, one in November, 1955 (R.G.R.). Lullingstone Park, Kent, 3-4 skulls in a batch of 16 owl pellets, 1952 (D.M.E.).

CHIROPTERA

Whiskered Bat *Myotis mystacinus*

Godstone Caves, Surrey, noted in Feb., 1951 (Woodroffe & Southgate, 1951); 2-3 on Dec. 11, 1955, and 11 on Jan. 29, 1956 (J.H.D.H., W.G.T.); 4 on Mar. 25, 1956 (G.B., A.S.H., R.E.P., W.G.T.). Bookham Common, Surrey, remains of one in tawny owl pellet, April, 1953 (G.B.). Richings Park, Bucks, one handled, April, 1950 (A. V. Tucker).

Natterer's Bat *Myotis nattereri*

Godstone Caves, Surrey, noted in Feb., 1951 (Woodroffe & Southgate, 1951); 1 on Dec. 11, 1955, and 7 on Jan. 29, 1956 (J.H.D.H., W.G.T.).

Daubenton's Bat *Myotis daubentonii*

Godstone Caves, Surrey, noted in Feb., 1951 (Woodroffe & Southgate, 1951); 1 on Dec. 11, 1955, and 2 on Jan. 29, 1956 (J.H.D.H., W.G.T.).

Pipistrelle *Pipistrellus pipistrellus*

Plumstead, roost under overhanging vegetation in sand-bank in Rockmount Road, May 14, 1955 (R.G.R.). Grove Park, Kent, one dead in July, 1951 (G.B., det. R. W. Hayman).

Long-eared Bat *Plecotus auritus*

Godstone Caves, Surrey, noted in Feb., 1951 (Woodroffe & Southgate, 1951); 1 on Dec. 11, 1955 (J.H.D.H., W.G.T.). Pinner, Middx., one caught by cat, May, 1954 (B.P.P.).

Barbastelle *Barbastella barbastellus*

Sidcup, Kent, one found dead, Old Forge Way, April 11, 1952, by R. B. Ling (D.M.E.).

CARNIVORA

Fox *Vulpes vulpes*

Reported from [Regent's Park (tracks in snow, Feb. 21, 1956 (R.G.R.)] Ken Wood area (frequently), Colne Valley between Denham and Harefield, and Perry Oaks sewage farm in Middlesex; Bookham Common,

Surrey; and Bromley, Bexleyheath (one electrocuted in Nov., 1955), and Chislehurst in Kent.

Stoat *Mustela erminea*

Stone Marshes, Kent, one on June 1, 1952 (G.B.).

Weasel *Mustela nivalis*

Stone Marshes, Kent, one seen on April 23, 1950, and reported to be regular by a local farmer (J.F.B.). Sidcup, Kent, one seen in Frog Lane Avenue, during summer 1949 (J.F.H.).

Mink *Mustela vison*

One trapped raiding a chicken run at Ruislip, Middx., in winter, 1953-54, and identified at the British Museum (Natural History), was obviously an escape from a fur farm (V.S.).

Badger *Meles meles*

Setts reported from Joydens Wood (several), Fooths Cray Place, and Keston, Kent; and at Harefield, Middx., and Rickmansworth, Herts.

Otter *Lutra lutra*

Ruxley gravel pit, Kent, one seen in 1951-52 (F.H.B.).

PINNIPEDIA

Common Seal *Phoca vitulina*

Kew, Surrey, one in the R. Thames near the Sion Gate, Nov. 8, 1953 (E.M.R.).

UNGULATA

Muntjac *Muntiacus muntjak*

Abbots Langley, Herts, abundant in district (G. Johnstone, *in litt.*, 14.5.54). Leavesden, Herts, one crossed hospital cricket ground, April 24, 1954 (S.H.S.).

Fallow Deer *Dama dama*

Cuffley Great Wood, Herts, tracks found in 1951 (B.L.S.).

LAGOMORPHA

Brown Hare *Lepus europaeus*

Reported from Joyden's Wood and Stone Marshes, Kent; Bushy Park, Harefield and Ruislip, Middx.; and near Croydon Airport, Surrey, on April 27, 1952 (W.G.T.).

Rabbit *Oryctolagus cuniculus*

The myxomatosis epidemic which started in Kent in the autumn of 1953 reached Sevenoaks within a mile or two of our boundary by Nov. 20 of that year, but the first report within the area appears to have been at Meopham, Kent, on April 21, 1954 (C.J.A.).

RODENTIA

Harvest Mouse *Micromys minutus*

Ruislip, Middx., over 30 nests found in 3 fields during harvest, c. 1954 (B.P.P.). Hayes, Middx., one dead in a garden, May 30, 1956 (B.C.).

Yellow-necked Mouse *Apodemus flavicollis*

Upper Belvedere, Kent, one caught by a cat, Sept., 1955 (R.G.R.).

Black Rat *Rattus rattus*

Brentwood, Essex, 1 caught in aviary, Sept., 1951 (H.M.).

Bank Vole *Clethrionomys glareolus*

Recorded from Dartford and Plumstead Marshes, Kent; Bookham Common, Surrey, and Ruislip and Brent Reservoir, Middx.

Field Vole *Microtus agrestis*

Recorded from Thames Ditton and Bookham Common, Surrey, and Ruislip, Bushy Park and Brent Reservoir, Middx.

REPTILIA

SQUAMATA: SAURIA

Slow-worm *Anguis fragilis*

Records from Sidcup and Joyden's Wood, Kent; Bookham Common, Surrey; Cuffley Great Wood, Herts; and a railway embankment at Wembley, Middx.

Common Lizard *Lacerta agilis*

Sheen Common, Surrey, 15 or more basking in sun, Sept. 10, 1950 (E.G.P.). Wandsworth Common, frequently caught c.1911 (Snell, 1951).

SQUAMATA: SERPENTES

Grass Snake *Natrix natrix*

Records from Stone Marshes, Sidcup, and Cray valley, Kent; and Bookham Common, Surrey. An albino found at Harefield, Middx., July, 1954 (Shipman, 1955).

AMPHIBIA

CAUDATA

Warty Newt *Triturus cristatus*

St. John's Wood, London, 1 in a garden in Norfolk Road, March 20, 1954, identified by Curator of Reptiles, London Zoo (R.W.P.). Occurs in suitable areas around Sidcup (D.M.E.).

SALIENTIA

Natterjack Toad *Bufo calamita*

Copse Hill, Wimbledon, several seen round fish-ponds in garden since 1932 (A. F. H. Lindner, *in litt.* to the late Dr. Malcolm Smith, October 10, 1951). Nearby Coombe Hill was a well known former locality for this species.

Common Frog *Rana temporaria*

Buckingham Palace gardens, one on Sept. 16, 1953 (W.G.T.).

Edible Frog *Rana esculenta*

Dartford Creek, Kent, a few noted on near-by marshes during 1950 (J.F.B.).

European Tree-Frog *Hyla arborea*

Hayes, Kent, a single specimen, presumably an escape, at a small pond on high ground, May 9-10, 1952 (G. Burness, G.E.M.).

REFERENCES

FITTER, R. S. R., 1949, A Check-List of the Mammals, Reptiles and Amphibia of the London Area, 1900-1949. *Lond. Nat.*, 28, 98-115.
 —, 1950, Some additional records of mammals, reptiles and Amphibia in the London Area. *Lond. Nat.*, 29, 133-36.
 PICKESS, B. P., 1955, Mammals recorded in the Ruislip area between 1951 and 1954. *J. Ruislip & Dist. N.H.S.*, 1955, 14-15.
 SHIPMAN, E., 1955, Letter in *W. Middx. & S. Bucks Sci. Soc. Q. Rev.* 10 (unpaginated).
 SNELL, W. E., 1951, Lizards in London. *Country Life*, 2.11.51, 1473.
 WOODROFFE, G. E., and SOUTHGATE, B. J., 1951, *Ent. mon. Mag.*, 87, 173.

The Birds of a Cultivated Area on Epsom Common

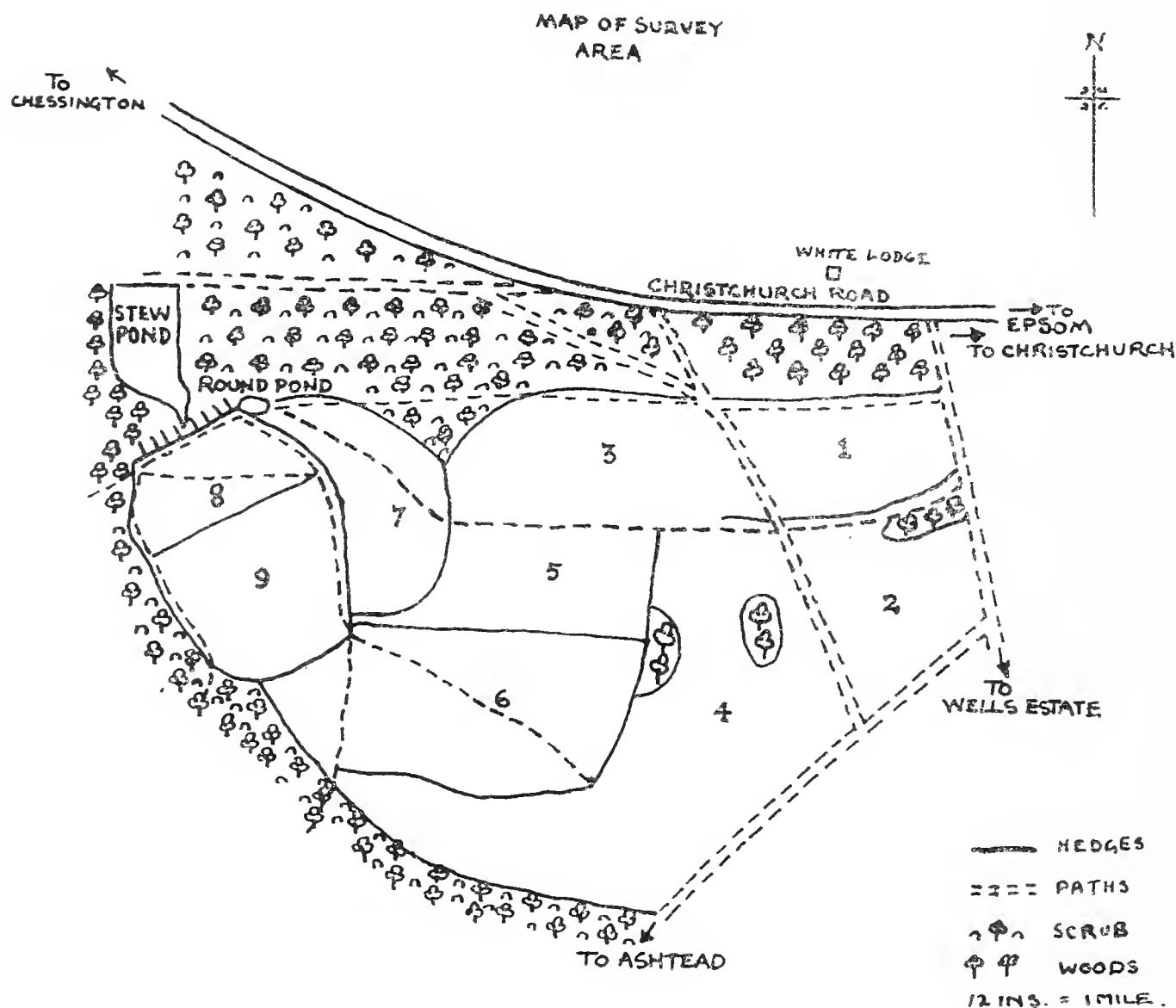
By D. A. ROOK

ON April 20, 1957, I heard a nightingale singing from the thicket at the south-western corner of the Stew Pond on Epsom Common. This was my first record of this species on the Common, although I had frequently heard them singing in Ashtead Woods, less than two miles away. Thinking about this, I recollect that, for the first time since the Second World War, no ploughing had taken place on the Common that Spring, and therefore there had been much less disturbance than usual.

As was the case with many others in the vicinity of London, wartime economy required that part of this common should be farmed, and consequently 111 acres were brought under the plough, and drainage ditches were dug.

In his chapter on Commons, Downs and Parkland in *The Birds of the London Area since 1900*, R. C. Homes has this to say:

"In the forties, also, increased ploughing-up during and after the war contributed to the difficulties of the more local birds of the heaths and scrubland community . . . Even when ploughing was abandoned the land became covered with long grass and the vegetation has not yet reverted to its original nature . . . No longer are there any extensive stretches of

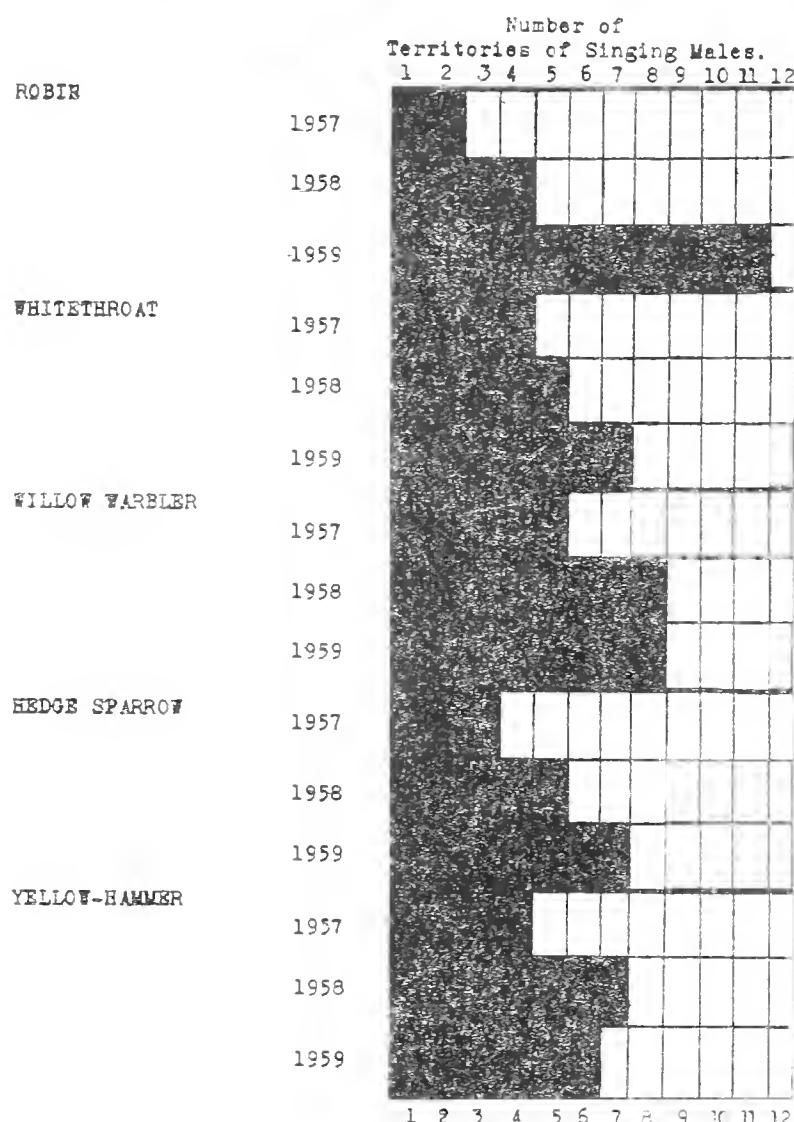


heath in our Area, and, instead, bracken, purple moor-grass, or in drier places like Headley Heath rosebay willow-herb, cover the ground. Elsewhere birch scrub has steadily increased its hold, as on parts of Epsom and Arbrook Commons . . . Before the last war Walton Heath and Ashtead, Bookham and Epsom Commons between them supported a varied community containing reed buntings, stonechats, grasshopper warblers in good numbers, red-backed shrikes and nightjars, but even in the thirties the gorse was being eliminated by fires . . . and now the stonechat has gone while only a few pairs of the other species remain. The decrease of gorse has been a serious factor in many other localities, notably for stonechat, linnet and yellow-hammer."

It occurred to me that on Epsom Common there was a good opportunity of recording, almost from the start, the regeneration of the ploughed-up area and its consequent effect on the bird population. I therefore adopted for consideration a convenient section—about 70 acres—which an old six-inch Ordnance Survey map of 1915 showed to be covered with scrub at that time. The area was roughly triangular, and was contained on two sides by woods and on the third by a main path. It was intersected by hedges (presumably the remains of the original scrub) and by drainage ditches, now mainly overgrown. The hedges were of mixed shrubs, including hawthorn, blackthorn, willow, gorse, hazel, alder buckthorn, crab apple and silver birch.

The only agricultural work still continued was the mowing of Fields 1, 2, 3 and 4 (see Map), but by 1959 only Field 4 was being cut for hay.

INCREASE IN TERRITORIES.



One might expect this in time to affect the skylark population, because the fields not being mown were already showing seedling gorse and trees, but no decline had yet taken place.

Unfortunately, my survey was of necessity restricted to the period May, 1957, to July, 1959. However, during the period under review, an increase did occur in many of the species of birds recorded, insofar as their numbers were sufficient to show a trend, and the histograms show figures for five of the commoner species.

In counting the breeding species I used the method adopted by Beven in the Eastern Wood part of the Bookham Common Survey (1951, *Lond. Nat.*, 30, 61-64): that is, I recorded during monthly visits all singing males in and immediately around the area, and only included in my count of territories of singing males birds which were heard singing in the same locality on more than one visit (the presence on other visits of other indications of breeding, such as pairs together, birds carrying food, etc. were noted and taken into account).

All the species which showed an increase were birds which nest in or near trees or bushes, and it is probable that the increase noted was caused by the thickening and widening of the hedges. Where gorse formed part of the hedge, the seeds shooting out, as I have seen them do in the hot sun, formed rows of seedlings parallel with the hedge, and in three years the earliest of these seedlings were already two to three feet high, and were themselves producing seed.

The number of species recorded during the survey was 50, and of the species mentioned by Homes (*op. cit.*) it included reed bunting, grasshopper warbler, red-backed shrike, linnet and yellow-hammer (still one of the commonest birds). Of these, only reed bunting, linnet and yellow-hammer were breeding. One whinchat was seen, but was probably only passing through.

The winter population of the area was confined almost exclusively to skylarks and meadow pipits, which were found mostly in Fields 1, 2 and 4, probably because this was the higher, and therefore on the whole the drier part of the area.

As regards the vegetation, I recorded this in very general terms only. I was surprised by the lack of bracken spread, as this plant grows right up to the wooded margins of the area, and is also present in some of the hedges. However, it may be that this part of the Common was chosen for cultivation because it was not overgrown by bracken. Young silver birches were growing up in places, particularly along the western edge of Fields 8 and 9, but were not common. A gratifying feature was the spread of gorse, which was not only growing out from the hedges, as already mentioned, but was to be found in groups all over all the fields by the end of the survey.

As regards mammals, rabbits were present in small numbers, and burrows were seen, but not more than six in use at any one time. One weasel and one fox cub were seen, and a hedgehog skin was found.

It is hoped that this paper may arouse interest in this type of survey, which I have found not only interesting in itself, but attractive because of the pleasant aspect of this part of Epsom Common.

ACKNOWLEDGMENTS

I should like to thank Miss E. M. Hillman and Dr. G. Beven for their advice and encouragement which helped me to persevere with the survey, and Mr. Robin Hill for drawing the map.

The Ferns of Epping Forest

By R. M. PAYNE

EPPING FOREST, lying as it does almost entirely on heavy London clay, is not notably rich in plant life; moreover the depredations of trippers and the polluted air blowing over it from the factories of north-east London both tend to reduce the variety and abundance of its flora. Nevertheless, so far as ferns are concerned it is one of the most interesting districts near London, and in ten years' acquaintance with the Forest I have in fact seen all but one of the species now found in the London Area (i.e. within 20 miles of St. Paul's) growing within a radius of four miles of the "Wake Arms," a popular meeting-place in the centre of the Forest.

Despite this pre-eminence—which applies equally to the Forest in relation to the county of Essex—there seems to have been no previous attempt to gather together what is known of the ferns of the district. There are, of course, references to ferns in the early Floras: the eighteenth-century Woodford botanist Richard Warner mentions several ferns in his *Plantae Woodfordienses* (1771), and a number of further records were added by the brothers B. M. Forster (1764-1829) and Edward Forster (1765-1849) in their annotated copies of this work, quoted extensively in two papers by P. Thompson in the *Essex Naturalist* for 1918-21. G. S. Gibson's *Flora of Essex* (1862) draws heavily on these three early botanists for its Epping Forest records. The first volume of *Transactions* of the Epping Forest and County of Essex Naturalists' Field Club—later known as the Essex Field Club—which was published in 1881 contains a list of Epping Forest ferns contributed by the local botanist James English. The *Essex Naturalist* for 1913 has a short paper, "Epping Forest Ferns," by W. Richter Roberts, but this is disappointing in that it is scarcely more than a brief list of the species found by the author. R. W. Robbins in his paper "The Flora of Epping Forest" published in the *Transactions* of our own Society for 1915 mentions in a single paragraph the ferns he himself had found in the area. (There are odd disparities between these two contemporary lists, which will be mentioned later). A few more localized records are given in the instalment of "Botanical Records of the London Area"—largely the work of R. W. Robbins—published in the *London Naturalist* for 1935; and of course the relevant part of the recent "Hand List" (*Lond. Nat.* for 1956) brings the list of Forest ferns more or less up to date.

For the purposes of this paper, which is in part historical, it would be inappropriate, and indeed impracticable, to consider only the arbitrarily defined area at present under the administration of the Corporation of London. In earlier days the Forest extended more widely, and embraced what are now more or less isolated remnants of woodland particularly in the northern parts of the district (where indeed the Lower Forest is completely separated from the main block of Forest land). Without stretching the historical aspect too much, therefore—since on this basis a case could be made for including almost the whole of Essex!—I shall treat as parts of Epping Forest all those areas which have been so regarded at any time since Warner produced his *Plantae Woodfordienses* in the 18th century. This means that the paper will survey the district extending broadly from Forest Gate in the south to North Weald and Nazeing in the north.

The persistence of the fern flora of the Forest is in pleasant contrast to the melancholy loss or diminution of many of its flowering plants. Doubtless the ferns are not so attractive to casual visitors as primroses, bluebells and foxgloves. Nevertheless Roberts in 1913 spoke of "the various species of ferns which still linger in the forest, although they are now fast disappearing . . . what growth there is seems often to be negatived by vandalism" ; and Robbins in 1915 strikes an equally gloomy note: "Epping Forest was formerly, like any other woodland, well supplied with ferns." It may well be true that the ferns are less abundant here than they used to be, but with the single exception of Polypody there seems little evidence of any marked reduction in numbers in recent years. So far as species are concerned, *Polystichum setiferum* (Soft Prickly Shield-Fern) was apparently last seen in 1927, but before then there had been no extinctions since the mid-19th century.

What is the present general picture of the distribution of ferns in Epping Forest? Apart from the almost ubiquitous Bracken, only two species, Broad Buckler and Male Fern, can be said to be at all common, and there are large areas in the south of the Forest from which even these two ferns are absent. All the other species are uncommon, ranging from some that are plentiful where they occur (e.g. Adder's Tongue) to others that are limited to only a very few plants in the whole area (e.g. Polypody, Scaly Spleenwort). It is perhaps surprising that so long ago as 1877 de Crespigny could remark in the preface to his *New London Flora*: "there is little out of the common to be obtained in Epping Forest nearer than Loughton," but this is certainly broadly true to-day so far as ferns are concerned. The area richest in sheer numbers of ferns (other than Bracken) is Wintry Wood, a damp oakwood on Boulder Clay in the extreme north of the district, where Male Fern and Broad Buckler occur in profusion, Lady Fern and Spiny Buckler are less numerous, and Polypody still lingers in the old pollarded hornbeams. No less than eight species of ferns can be found in the block of woodland adjoining the Lower Forest east of Coopersale Common, which though not under the control of the Corporation of London was regarded as part of Epping Forest by earlier botanists, and at least part of which (Gernon Bushes) is ancient forest land (V.C.H., Essex, Vol. IV).

In the south of the district there is an interesting colony of ferns in Wanstead Park, where four species other than Bracken are represented.

De Crespigny made another accurate statement when he said "the best localities for plants, especially ferns, are the gullies and hollows on the forest flanks." Ferns do not like flat ground, and it is on the sides of ditches and streams and on sloping banks, particularly where these have a northerly aspect, that most of the interesting ferns in the Forest are to be found.

The list of 19 species—of which two are certainly extinct—includes four spleenworts which grow only on walls, and which in a sense therefore may be held to be not native to the Forest. These spleenworts are however entirely confined to such artificial habitats in this part of Britain, so that to exclude them from a survey of the fern flora of the Forest area would be no more justifiable than to exclude them from a county Flora.

In the following account of the species which occur, or have occurred, in Epping Forest, reference is made to the two botanical vice-counties in which the Forest lies. The boundary between V.-c.18 (South Essex)

and V.-c. 19 (North Essex) follows the main road from Waltham Abbey up to the Wake Arms and thence to Epping and Ongar.

Osmunda regalis L. Royal Fern V.-c. 18, [19]

This, the largest of British ferns, seems to have occurred wild in the Forest up to about 1850. Warner recorded it "on the side of a gravel-pit, behind Mr. Moxon's house, near the path leading from thence to Fair Mead bottom," and E. Forster knew "one plant on the Lower Forest beyond Epping 1840, near to Turnpike Road street, pointed out to me by Doubleday." Gibson cites another record for Chingford. It is not included in English's 1880 list.

Seventy years later, round about 1920, a small plant was seen in a gravel-pit which is now Blackweir Pond, growing with Hard Fern (*Essex Naturalist* for 1919, 1922; J. Ross *in litt.*), but it seems likely that this was an escape from the flourishing planted colony in Knighton Wood—and I understand from J. Ross that *Osmunda* was also grown in a High Beach nursery at that time.

Knighton Wood has been open to the public as an integral part of Epping Forest since 1930; there are still many fine plants of Royal Fern there, and some young growth suggests that the species can be said to be fairly naturalized.

Pteridium aquilinum (L.) Kuhn. Bracken V.-c. 18, 19

Bracken is one of the commonest plants of the Forest, dominating large areas especially on the higher ground where the clay is capped by gravelly soil and drainage is better; but it occurs only locally in some of the southern sections of the Forest, and is absent from much of the Lower Forest, north of Epping.

Blechnum spicant (L.) Roth. Hard Fern V.-c. 18

There are at present two colonies of this rare fern, one in the parish of Loughton and the other north-east of Epping. In each case the fern is clustered along the shady side of a deep ditch, and growing together with another uncommon species, the Mountain Buckler.

There are many old records for the Forest, E. Forster recording it as far south as Snaresbrook [Eagle] pond, and "between Loughton and Epping in plenty." W. Howard found it in 1905 at Ambresbury Banks, and in 1910 at Dulsmead Hollow, but it has since disappeared from both these localities. In 1921 it was growing in the former gravel-pit at Blackweir Pond (see above), but after that it appears to have eluded local botanists until 1952, when one of the present colonies was discovered by J. W. Dyce.

Phyllitis scolopendrium (L.) Newm. Hart's Tongue V.-c. 18

In 1951 there was a single plant of Hart's Tongue in the wall surrounding High Beach churchyard, in the centre of the Forest; but at present (1960) it seems to be found only round the edges of the Forest, where it is often to be seen in drain vents, and occurs rarely on old walls, as at Loughton church. Almost all the early records also refer to walls and brick-work, though B. M. Forster noted it in 1826 in a "ditch bank in a field between Woodford and Woodford-bridge-road," and E. Forster "in a hedge between Friday hill and Chingford."

Asplenium adiantum-nigrum subsp. *adiantum-nigrum*. Black Spleenwort V.-c. 18

This fern grows on a low wall at the very edge of the Forest in Loughton, and in great profusion on some walls near Epping. The very

few old records all refer to wall sites, to which this species seems virtually restricted in the London Area, though growing elsewhere on hedge-banks, etc.

Asplenium trichomanes L. Maidenhair Spleenwort V.-c. 18

This rare species has been recorded sparsely on walls in the district for at least 200 years. In 1797 B. M. Forster collected it from a wall "at the end of Wood-street near Whips cross," and his specimen is still to be seen in the Essex Field Club herbarium at Stratford. Other early records are for walls at Leyton and Woodford, and there is a specimen in the L.N.H.S. herbarium labelled "nr. Blake Hall, Wanstead," collected in 1907 by J. O. Braithwaite.

In 1913 Roberts thought it had disappeared from the area, but it was seen in 1927 at High Beach (*Essex Naturalist*, Vol. 22) and certainly occurred there from 1953 to 1958. In 1959 the wall on which the little colony grew was repointed, and the ferns eradicated: such is the tenuous hold on existence of some of our rare plants.

Asplenium ruta-muraria L. Wall Rue V.-c. 18, 19

This tiny fern grows in plenty on a late-Victorian wall very near the Forest in Loughton, and a few other colonies occur in the northern parts of the district. In Warner's time it was "Found on an old wall at Layton-stone, near The Green-Man and on the wall before Mr. Bosanquet's House on the Forest, between that place and Woodford."

Ceterach officinarum DC. Scaly Spleenwort V.-c. 18

This delightful little fern grows in some numbers on a century-old wall at the edge of the Forest near Epping, where it was apparently first noticed by my father, L. G. Payne, on an excursion of this Society in 1943. The only other record for the district is a disputed one for Woodford in the 18th century (see *Essex Naturalist*, Vol. 19).

Athyrium filix-femina (L.) Roth. Lady Fern V.-c. 18, 19

The graceful Lady Fern occurs very locally in damp places throughout the Forest north of Loughton, but I have not seen it farther south, except in Wanstead Park where there are several plants—only seven miles from St. Paul's. Oddly enough, Robbins said in 1935 that he had never seen it in the Forest "in over 40 years," though Roberts in 1913 referred to "some fine plants still existing." Apparently it was not common even 150 years ago, since E. Forster, who found Hard Fern plentiful, mentions only a single locality: "on the banks of a rivulet in the woody part of the Forest beyond Loughton near the road which leads from Honey Lane green to the Epping road." (It still grows to-day by a stream identifiable from that description).

Dryopteris filix-mas (L.) Schott. Male Fern. V.-c. 18, 19

The Male Fern is plentiful north of Epping in Wintry Wood and elsewhere, fairly common between Epping and Loughton, and scattered thinly, mainly along the edges of streams, between Loughton and Wanstead Park (where there are a number of plants).

Dryopteris borreri Newm. Borrer's Male Fern V.-c. 18

This striking fern has been regarded by most botanists in the past as a variety of the Male Fern (var. *paleacea* auct.) but it is now recognized as a distinct species. It is extremely scarce in the Forest. A single large specimen grew near Copley Plain from 1951 to 1956, when it was apparently dug up and taken away; I have seen it more recently in Wanstead Park,

and odd plants may well occur elsewhere. There are no early records, perhaps partly because of the doubts of its specific distinctness.

[*Dryopteris cristata* (L.) A. Gray. Crested Buckler Fern

An unfortunate misprint, which has gone uncorrected, occurred in the *Essex Naturalist* for 1945-50, p. 143, where this very rare fern is reported to be "common in Epping Thicks." Clearly *D. aristata* (= *dilatata*) was intended.]

Dryopteris lanceolatocristata (Hoffm.) Alston (= *spinulosa* Watt.)

Spiny Buckler Fern

V.-c. 18, 19

This is not a common fern in the Forest: it occurs in small numbers in half a dozen localities between Buckhurst Hill and North Weald, usually in boggy clearings in the wood. Roberts did not mention it in his 1913 paper, and the early records suggest that it was never plentiful in the district, though in E. Forster's day it grew as near London as "Longdown Wood near Hale End" (if indeed it was correctly differentiated from Broad Buckler).

Dryopteris dilatata (Hoffm.) A. Gray. Broad Buckler Fern V.-c. 18, 19

The distribution of this fern in the Forest is very similar to that of the Male Fern; it is probably slightly the more plentiful of the two throughout the district. Some very big plants are to be seen, especially in Wintry Wood, and it is of interest that in his classic *History of British Ferns* (2nd edition, 1854) Edward Newman mentions a very large specimen, five feet in length, "for which I am indebted to Mr. John Ray, of Epping."

Polystichum setiferum (Forsk.) Woynar. Soft Prickly Shield-Fern

[V.-c. 18]

With the Shield Ferns we reach the extinctions in the Forest. This handsome species was probably never common here, and seems to have been last seen on 12th November, 1927, when F. W. Thorrington noted it on a walk from Theydon Bois to High Beach (*Essex Naturalist*, Vol. 22). Neither Roberts nor Robbins ever saw it in the Forest, and already in 1880 English regarded it as probably extinct. Even E. Forster apparently knew of only two localities: "Found in a hedge the edge of the Forest on the Hawk and in a lane near Walthamstow Church" (though there is some doubt which species was intended by this reference—see *Essex Naturalist*, Vol. 19). Gibson cites a further record for Epping.

Polystichum aculeatum (L.) Roth. Hard Prickly Shield-Fern. [V.-c. 18, 19]

It is fairly certain that this fern has been extinct in the Forest for about 100 years, the last botanist to have recorded it being Henry Doubleday of Epping, who died in 1875. E. Forster knew it (as *P. lobatum*) "in moist shady hedges, particularly in a lane leading from Hale End to Chapel End Walthamstow," and Gibson cites records for Woodford (1789), Epping (Doubleday) and Chingford. English linked it with *P. setiferum* as probably extinct in 1880.

Thelypteris oreopteris (Ehrh.) Slosson. Mountain Buckler Fern. V.-c. 18

This rare fern (Plate 1) occurs in a few small colonies in the Forest, all north of Loughton. In one locality there are some very big plants with fronds four feet long. It seems to like to grow on the sides of deep ditches or at least on ground sloping markedly to the north or north-east. Often the plants are almost hidden by Bracken, while in two places Hard Fern is also present.

Mountain Buckler appears always to have been uncommon in the district, though in E. Forster's day it grew as far south as "the bank of a ditch the S. side of Snaresbrook pond with *Osmunda spicant*" [Hard Fern]. Thus in 1880 James English reported that he had for several years considered it extinct in the Forest, but in that year he rediscovered a few plants in two places (*Trans. Essex Field Club*, Vol. 1).

Thelypteris palustris Schott. Marsh Buckler Fern

V.-c. 18

The only locality for this fern in the London Area is in the woods north-east of Epping (Plate 2), where there are two large colonies some 200 yards apart. In one an almost pure stand of the fern occurs on swampy ground under a canopy of Hornbeams, but the other is in an open glade where *Thelypteris* competes—apparently very successfully—with a tangle of Water Mint, Creeping Buttercup, Soft Rush, Yorkshire Fog, Marsh Thistle, Woody Nightshade and Brambles.

E. Forster recorded the Marsh Buckler in the early 19th Century "in a woody bog in a field near Epping probably forming part of Wintry Wood" where, according to Newman (*op. cit.*) it was discovered by John Ray, who collected in the 1840s. (In 1880 English thought it had become extinct, but presumably he did not know the locality). Nearer our own time Robbins in 1935 said "in the Forest not far from Epping. It was discovered in 1909." There is a specimen in the Miller Christy herbarium at Stratford labelled "Epping Forest 1873 ?" and one in the L.N.H.S. herbarium collected by Robbins in 1909.

There can be no doubt that all these records refer to the locality where this delicate, pale green fern still flourishes: long may it continue to do so!

[*Thelypteris dryopteris* (L.) Slosson. Oak Fern

V.-c. 18

Richard Warner recorded this unusual fern on the walls of old Chingford church. The Forsters and Gibson were sceptical of his record, but in the light of the recent discovery of Oak Fern on another Essex wall I would not rule out the possibility that it may have occurred 200 years ago at Chingford.

Much more improbable are two MS records of W. Howard. He claims to have seen a single plant on a decaying tree-stump near Theydon Bois in 1905, and another in Epping Thicks in 1911 (in company with W. R. Roberts and W. J. Foster): Roberts in his 1913 paper said of this species that it had been recorded in one or two places but had disappeared. No other botanist has ever seen Oak Fern in the Forest, or indeed in any other natural habitat in Essex. There may of course have been a deliberate introduction: thus a few years ago I was shown a very large Hart's Tongue in the Forest growing on flat ground beneath a canopy of beech trees where no other vegetation occurred—quite an impossible situation for this fern !]

Polypodium vulgare L. Polypody

V.-c. [18], 19

This is the one fern which has certainly decreased in abundance in the Forest over the last hundred years, and indeed is now noticeably scarcer even than it was ten years ago. There seems no doubt that it was plentiful in the mid-19th century. Edward Newman refers to it as characteristic of the Forest in successive editions of his *History of British Ferns* (1840-65), and in 1875 F. G. Heath wrote "No plant is so plentifully vended in the London streets as our Polypody; for Epping Forest . . . furnishes the plant in thousands." (*The Fern Paradise*.) Miller Christy writing in the *Essex Naturalist* in 1923 recollects from his childhood

PLATE I. *Thelypteris orocopteris* (Mountain Buckler Fern) growing near Loughton.

Photo by T. G. Collett

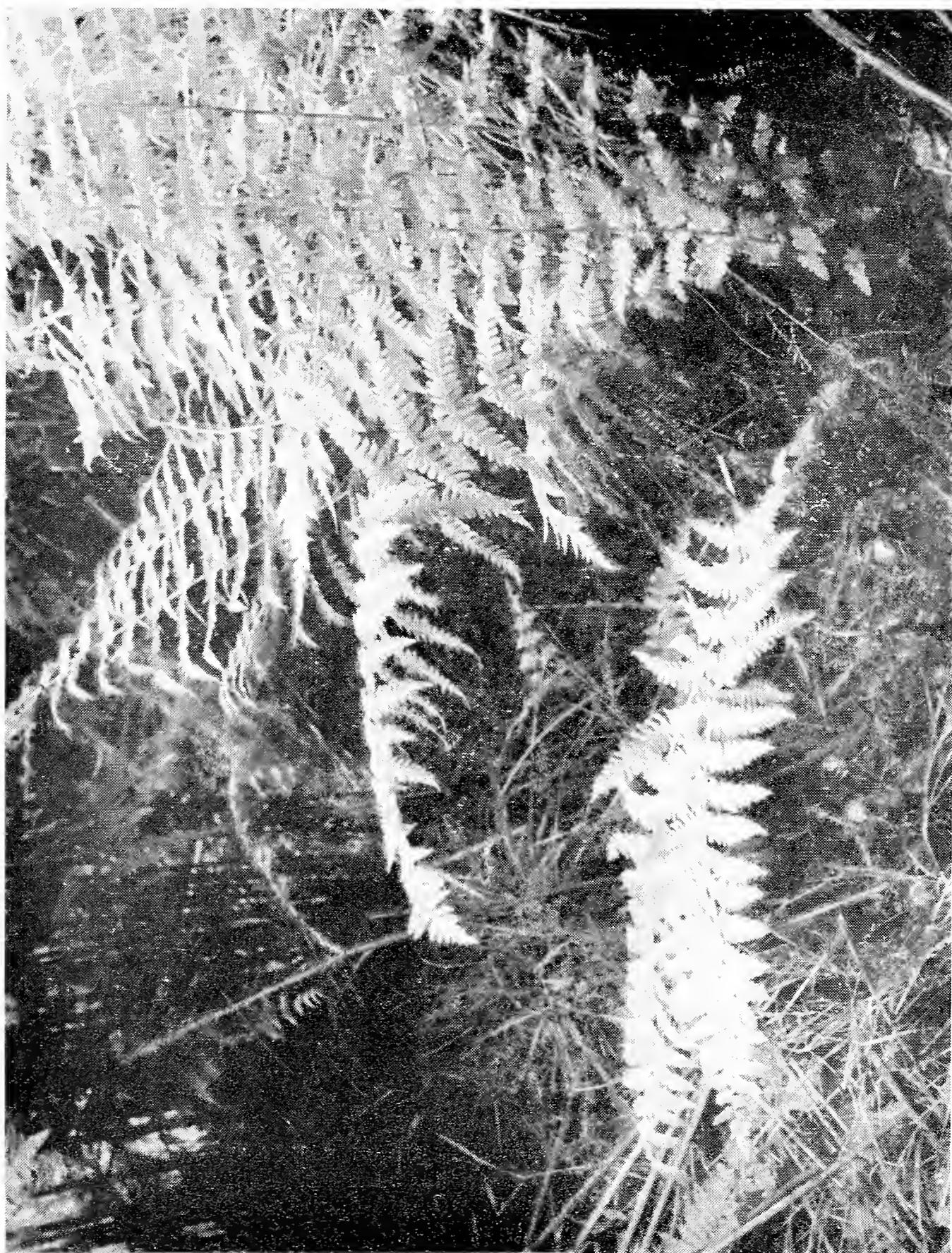




PLATE 2. *Thelypteris palmata* (Marsh Buckler Fern) growing near Epping.

Photo by T. G. Collett

(about 1870) "the masses of fronds of Polypody which then covered the crowns of many of the trees, especially in that part lying north of Epping, including Wintry Wood."

By 1913 Roberts was saying that it "used to be abundant, but has been reduced in numbers by the continued removal of the roots." In 1935 Robbins described it as very rare in the Forest. It now (1960) appears to be confined to only one or two of the pollarded hornbeams in Wintry Wood (V.-c. 19), and there is little sign of young growth. (It still occurs on an old wall in Loughton, a mile from the Forest).

It may well be that in Victorian times Polypodies were grubbed up and sold in London, but this surely cannot account for the recent almost total disappearance of the species. The fact that other ferns are not noticeably on the decrease in the Forest suggests that some special factor may be affecting the Polypody. In his handbook *Epping Forest* (1958) Alfred Qvist, the Superintendent of the Forest, puts forward the idea that the increased gloom in the Forest which followed the cessation of regular pollarding may have led to the disappearance of some plants including Polypody. I am inclined to think that the principal reason for its decline may arise from its habit, unusual among English ferns, of not shedding its fronds in winter, so that it may be less able to withstand the polluted air which the prevailing wind blows across the Forest from the factories of the Lea valley, a menace which has certainly been increasing throughout the past century. Is it a coincidence that the two extinct Forest species, the Shield-Ferns, also tend to retain their fronds throughout the year?

Ophioglossum vulgatum subsp. *vulgatum*. Adder's Tongue V.-c. 18

This curious little plant occurs plentifully in several places north of Chingford, usually in damp grassland; I have not found it in the Lower Forest. In some years it is extremely abundant in one locality near Loughton, where it grows beneath hawthorn bushes and round their fringes.

ACKNOWLEDGMENTS

I am indebted to T. G. Collett for a day spent under unfavourable circumstances in obtaining the photographs which accompany this paper. J. W. Dyce, Secretary of the British Pteridological Society, and the late S. P. Rowlands have given me the benefit of their long experience of our native ferns. Miss J. Pugh confirmed the identity of *Dryopteris borreri* in its Copley Plain site. J. Ross and the late W. Howard have helped me by correspondence, and I have also had access to unpublished records in the possession of the Essex Field Club.

Further Notes on Relics of the Great North Wood

By J. EDWARD LOUSLEY

THE investigation of Dulwich Woods carried out during 1958 was described in the last issue of this journal (*Lond. Nat.*, 38, 77-90, 1959). It will be recalled that an area of enclosed woodland was examined and found to be sessile oakwood, and a relic of the Great North Wood which formerly extended for some five miles along the slopes of the high ground from Brockley to Selhurst. It was shown that this sessile oakwood still

extended continuously for nearly a mile, and that some of the associate species could be traced back in botanical records for evidence of long persistence. During 1959 a few additional species of considerable interest have been found within the area which was the main subject of the earlier paper, and it has been found that sessile oakwood relics are considerably more extensive than was thought. It is the purpose of the present paper to put these additional facts on record.

DULWICH WOODS

The enclosed area described last year is made up of Peckarman's Wood, Ambrook Hill Wood, and Lapse Wood (*Lond. Nat.*, 38, 79, 1959, Fig. 2). It was visited again with F. Rose, E. C. Wallace, and J. E. Woodhead on May 3, 1959, by myself on May 9, 1959, and with J. E. Woodhead on September 12, 1959. The first visit was very rewarding in additional records of vernal species which had been overlooked in 1958 when our inspections did not commence until June. It was found that wood anemone, *Anemone nemorosa*, greater stitchwort, *Stellaria holostea*, wood violet, *Viola riviniana*, and hairy wood-rush, *Luzula pilosa*, were all very much more plentiful and widespread than indicated in the published list.

Thanks to the energy and enthusiasm of Dr. Rose on a very wet day, parts of the woodland on the east side of the disused railway were entered. An area of sessile oakwood was found in the lower part of the grounds of the "Hoo," being the detached part of Ambrook Hill Wood cut off by the railway and reported as still existing in 1875 (see *Lond. Nat.*, 38, 84, 1959). The following species were observed:—

TREE LAYER	
	<i>Quercus petraea</i> —dom.
SHRUB LAYER	
	<i>Ilex aquifolium</i> —f.
	<i>Sorbus aucuparia</i> —occ.
FIELD LAYER	
	<i>Pteridium aquilinum</i> —ab.
	<i>Endymion non-scriptus</i> —l.ab.
	<i>Anemone nemorosa</i> —l.c
	<i>Ribes uva-crispa</i> —occ.
	<i>Ruscus aculeatus</i> —r. (probably native)
	<i>Convallaria majalis</i> —l. (probably native)
	<i>Allium ursinum</i> —l.
	<i>Ranunculus ficaria</i> —occ.
	<i>Vinca minor</i> —r. (perhaps native)
	<i>Oxalis acetosella</i> —r.
	<i>Polygonatum multiflorum</i> —r. (probably native)

This area of sessile oakwood should be added to the map given in Figure 2 on page 79 of the paper last year as immediately east of the word "railway" shown on that map. It should also be added to Figure 1, on the same page.

The following records should be added to the list given earlier. Species which are not native are indicated by *.

Ranunculus ficaria L. Celandine. Rare in Peckarman's Wood; locally abundant by the disused railway. Recorded from Dulwich by Carruthers, 1882.

Cardamine pratensis L. Lady's Smock. Near the disused tennis court in Peckarman's Wood.

Oxalis acetosella L. Wood Sorrel. Peckarman's Wood, Ambrook Hill Wood, The Hoo.

Crataegus oxyacanthoides Thuill. Midland Hawthorn. Rare, in two places in Peckarman's Wood and in Ambrook Hill Wood.

Sorbus aria (L.) Crantz. White Beam. One tree in Peckarman's Wood and two in Ambrook Hill Wood. Recorded from Dulwich Wood by J. D. Salmon, *Fl. Surrey*, 82, 1863. He suggested that here and at "Redland Hill, Dorking" it was probably planted but it seems that his reason for this statement was that he regarded the tree as native only on the chalk. At Redlands and elsewhere in Surrey it occurs off the chalk in circumstances which offer no reason to suppose that it has been introduced by human agency.

- * *Hedera colchica* K. Koch. Scaly Ivy. By boundary between Peckarman's Wood and Wood Hall.
- * *Quercus ilex* L. Holm Oak. Ambrook Hill Wood, 2 bushes, apparently self-sown.

Primula vulgaris Huds. Primrose. Peckarman's Wood, two plants.

Vinca minor L. Lesser Periwinkle. Peckarman's Wood (a large patch) and the Hoo. Not flowering. This species was recorded by Curtis, *Fl. Londinensis*, in 1780 from Lordship Lane, Dulwich, and may well be native in Dulwich Woods.

Galium saxatile L. Heath Bedstraw. Found by Dr. Rose in the first enclosure adjoining Peckarman's Wood from the south-east corner. Milne and Gordon recorded it from Sydenham Hills in 1793 (*Indigenous Botany*, 1, 171) and their locality is likely to have been Sydenham Common, part of which adjoined Ambrook Hill Wood.

Polygonatum multiflorum (L.) All. Solomon's Seal. Peckarman's Wood and the Hoo. These plants, found by Dr. Rose, are of the smaller-flowered less vigorous wild type, unlike the garden hybrid which Mr. Woodhead showed me on the bank of the disused railway in 1958. Solomon's Seal is rare in Surrey but was found at Stockwell in hedges in the 18th century and may be native in Dulwich Woods.

Convallaria majalis L. Lily of the Valley. Three scattered patches in Peckarman's Wood, and also in the Hoo. The species is thus much more widely distributed than we were aware in 1958, and the flowers are smaller than those of plants usually grown in gardens. I now have no hesitation in accepting the species as relics of the plants which Curtis in 1785 knew as "Not uncommon in woods about Dulwich."

- * *Narcissus* spp. The "daffodils" reported to us in 1958 as plentiful in Peckarman's Wood are cultivated Narcissi which were no doubt planted to improve the view from the main track.

Ruscus aculeatus L. Butcher's Broom. Found by Dr. Rose at the Hoo. Perhaps native—it occurred formerly at Norwood (Cooper, *Fl. Metrop.*, 16, 1836).

- * *Endymion hispanicus* (Mill.) Chouard. Spanish Bluebell. Peckarman's Wood near the boundary with Wood Hall. Doubtless planted but easily overlooked among the wild bluebells with which it may hybridize.

Allium ursinum L. Ramsons. Two large patches in Peckarman's Wood, also in the Hoo.

(*Arum maculatum* L. Lords and Ladies. By Dulwich Wood Park Road. Recorded for Dulwich in Cooper, *Fl. Metrop. Suppl.*, 2, 1837.)

THE BRYOPHYTES OF DULWICH WOODS

The following bryophytes were found by Dr. F. Rose and E. C. Wallace on May 9, 1959, and I am indebted to them both for help in compiling this list. The habitats are indicated by the following abbreviations:—A, ruins of Wood Hall; B, Peckarman's Wood; H, The Hoo.

MOSES

Amblystegium serpens (Hedw.) B. & S.—B
Atrichum undulatum (Hedw.) P. Beauv.—B
Barbula convoluta Hedw.—A
Brachythecium rutabulum (Hedw.) B. & S.—B
Bryum argenteum Hedw.—A
Bryum bicolor Dicks.—A
Ceratodon purpureus (Hedw.) Brid.—A
Dicranella heteromalla (Hedw.) Schimp.—B, H
Eurynchium murale (Hedw.) Milde—B (on rockwork on boundary)
Eurynchium praelongum (Hedw.) Hobk.—B
Fissidens bryoides Hedw.—B
Funaria hygrometrica Hedw.—A
Isopterygium elegans (Hook.) Lindb.—B, H.
Leptobryum pyriforme (Hedw.) Wils.—B (on ruined greenhouse on boundary)
Mnium hornum Hedw.—B, H
Plagiothecium silvaticum (Brid.) B. & S.—H
Pohlia nutans (Hedw.) Lindb.—B
Tortula muralis Hedw.—B (on a brick)

LIVERWORTS

Calypogeia trichomanis agg.—H
Calypogeia fissa (L.) Raddi—B
Cephalozia bicuspidata (L.) Dum.—H
Lepidozia reptans (L.) Dum.—B
Lophocolea bidentata (L.) Dum.—B
Lophocolea heterophylla (Schrad.) Dum.—B

OTHER RELICS OF THE GREAT NORTH WOOD IN DULWICH

In the account published last year it was shown that in addition to the extensive relics of Peckarman's, Ambrook Hill, and Lapse Woods which were examined in detail, much of Low Cross Wood still exists although enclosed in the grounds of numerous houses. The position of King's Wood (39 acres in 1806) and Vicar's Oak Wood (36 acres) was shown on the map (Fig. 1, p. 79) and these were said to be now destroyed. So far as King's Wood is concerned this is correct. The site is now occupied by the large L.C.C. housing estate which perpetuates the name. The only relic of the wood is a group of trees of *Quercus petraea* left standing between the huge blocks of flats.

Of Vicar's Oak Wood, however, there is still plenty of evidence. Below Crystal Palace Parade, and behind the houses on the east side of Farquhar Road, extending north to Dulwich Wood Park and its junction with College Road, there is a strip of woodland about 500 yards long. Sessile oak is scattered through this wood, bluebells are locally abundant (children were picking them at the time of my visit), a large patch of celandine was seen, and great horsetail, *Equisetum telmateia*, was plentiful in one place. Male fern, *Dryopteris flix-mas*, was common, and one plant of *Dryopteris dilatata* was observed. Most of this woodland is in the grounds of houses and I was only able to investigate part of it.

From this fairly substantial relic, traces of a woodland flora and scattered trees of sessile oak were found for some distance to the north-west. On one plot on the S.W. side of Dulwich Wood Park, bluebells, dog's mercury and hairy woodrush were plentiful. Further down on the same side a strip on which building was in progress had lords-and-ladies, *Arum maculatum*, ramsons, *Allium ursinum*, celandine and wood anemone. Traces of Vicar's Oak Wood still extend from near the Crystal Palace Parade to Kingswood Drive. Incidentally, there is a white beam, *Sorbus aria*, on the embankment of the Parade above the disused railway in a position where it is almost certainly bird-sown.

OTHER AREAS OF SESSILE OAKWOOD

To the south of the relics of woodland so far described, the Great North Wood extended for more than two miles to Selhurst. Remnants of

Selhurst Wood occurred formerly within the triangle formed by the three sets of railway lines at the junction just south of Selhurst railway station and also to the east of the station itself, but these were destroyed by building and the construction of additional sidings. Much of Grange-wood Recreation Ground (G/R. 329689), to the north of this, is sessile oakwood. The area is now so trampled that there is practically no ground flora, but holly, which is an associate of sessile oak elsewhere, is plentiful and probably a relic rather than planted.

Convent Wood, Norwood (G/R. 324708) is private and well-fenced, but can be inspected from Wood End, Convent Hill and Hermitage Road. Sessile oak is dominant, with holly and blackberry abundant as undergrowth.

Biggin Wood, Norbury (G/R. 317703) has only recently been opened to the public and still has an interesting ground-flora. Although it would have been on the fringe of the main mass of the Great North Wood the vegetation is remarkably similar to that of the other areas examined. Sessile oak occurs throughout the wood, and to the south of the main track it is dominant, forming a close canopy. By the track the oak is coppiced, mixed with other trees and small patches of acid grassland. At the north end the natural character of the wood has been spoiled by the introduction of laurels, rhododendrons and other exotics. The following list of species excludes obvious introductions:—

TREES

Quercus petraea (Mattuschka) Liebl.—ab. and l. dom.
Sorbus aucuparia L.—occ.
Prunus avium (L.) L.—occ.
Betula pendula Roth—occ.
Acer campestre L.—occ.
Acer pseudoplatanus L.—r.
Fraxinus excelsior L.—r.
Taxus baccata L.—old trees at N. end, smaller trees and seedlings elsewhere.
Ulmus procera Salisb.—l. dom. in corner on E. side, probably spread by suckers from a single introduction.
Fagus sylvatica L.—small tree on W. edge, perhaps planted.

SHRUBS AND CLIMBERS

Rubus fruticosus L.—c.
Crataegus monogyna Jacq.—f.
Sambucus nigra L.—f.
Ilex aquifolium L.—f.
Hedera helix L.—f.
Salix cinerea L.—l.
Ulex europaeus L.—l.
Sarothamnus scoparius (L.) Wimm. ex Koch—l.

HERBS

Endymion non-scriptus (L.) Garcke—l. ab.
Rumex sanguineus L.—c.
Arum maculatum L.—c.
Anthriscus sylvestris (L.) Hoffm.
Alliaria petiolata (Bieb.) Cavara and Grande—c.
Ranunculus ficaria L.—l.
Chamaenerion angustifolium (L.) Scop.—l.
Urtica dioica L.—l.
Taraxacum officinale Weber—occ.
Ranunculus repens L.—occ.
Solanum dulcamara L.—occ.
Pteridium aquilinum (L.) Kuhn—occ.
Rumex obtusifolius L.—r.
Carex sp.—leaves only, by pit full of water.
Scrophularia nodosa L.—r.
Arctium sp.—r.

HERBS OF ACID GRASSLAND

Agrostis tenuis Sibth.—l.
Rumex acetosella L.—l.
Hypochoeris radicata L.—l.

The frequencies in this list refer to the wood as a whole and this, as already mentioned, includes areas which are not sessile oakwood although probably derived from it. Some of the species are not plants of woodland

proper, but only occur in woods where there are clearings or rides, or near the edge where there is more light. Nevertheless many of the plants included are likely to be survivors from the time when sessile oakwood was widespread in the district. The general character of the vegetation is that of the shallower soils like Lapse Wood rather than of the deeper soils with abundant bracken like Peckarman's Wood. Biggin Wood is interesting in that it has not been open to the public sufficiently long for the ground flora to be destroyed, although trampling has already had some effect. Bluebells are still sufficiently plentiful for people to pick small bunches, but the keeper tells me that until a few years ago the lower part of the wood was blue with them, which could hardly occur now even if the flowers were not picked as they opened. No doubt in a few years time trampling will reduce the ground flora to the sorry dreariness of the type seen in Grange Wood.

Thus work during 1959 has shown that relics of the Great North Wood are to be seen over a wider area than was known last year, and that a number of additional species of interest still survive. These include wild cherry, white beam, and lesser celandine of the plants for which we have old records, and wood sorrel, ground ivy and lords-and-ladies of vernal woodland species which might have been expected. It is pleasing to add that during the year I have received a letter from Dr. S. W. Carruthers who compiled the list of Dulwich flowers in 1882 which I cited, but he has not yet been able to give me any additional information about these woods as he knew them in his schooldays.

That the Great North Wood was mainly oak we knew from the historical records. That this oak was predominantly sessile oak, *Quercus petraea*, and not the common species, *Q. robur*, is proved beyond doubt. This fact now seems so obvious from the printed evidence (including the reports from Honor Oak and Norwood in the Society's own records) that one can only wonder that attention has not been drawn to it before.

Botanical Records for 1959

Compiled by J. EDWARD LOUSLEY

To the botanists of the London Area the 1959 season proved to be one noteworthy for the weather and its effect rather than for the plants it produced.

There was nothing exceptional about the early part of the year. March, April and May produced reasonable rainfall and temperatures about normal, so that there was a good display of spring flowers at about average dates. After the first week in June there was a sudden and lasting change in the weather, and for four months there was very little rain and consistent warmth. It was not until October 10 that there was a definite break in these conditions. By July many plants were wilting through lack of rain, and by August, in spite of a few showers, large stretches of country were parched. Heath fires were all too frequent and good displays of summer flowers rare. In other parts of Britain there were compensations in the free flowering of species which required more than average warmth, and in the appearance of species which thrive on the dried-up beds of ponds, but in the London Area there was little to note of this kind. Some botanists, including the writer, enjoyed the warmth, but others found it discouraging to exercise, and all had difficulty in finding

the usual number of species to report in a parched countryside. Although the quantity of records contributed for the year is about the same as usual, it is not surprising that there is a decrease in the proportion of special interest. Absence of really severe frost until after Christmas made late fieldwork possible but aliens, which are generally a source of interest in the autumn, were extremely scarce as they had been unable to germinate on the dry and baked tops of the rubbish-tips.

A feature of 1959 was the wide publicity given by the Press to the appearances of thorn-apple and hemp. The London Area received its full share of this publicity, but remarkably little effort was devoted to presenting the facts with reasonable accuracy and the reporters seemed quite unaware that over the country as a whole they were confusing the records of more than one species of thorn-apple of very different status. Common thorn-apple, *Datura stramonium*, was a little more frequent round London in 1959 than in the three previous very unfavourable seasons, but the number of reports was hardly above the average. Hemp, *Cannabis sativa*, appears every year on many of our rubbish-tips, and is likely to continue to do so as long as the seed is sold as food for cage birds. There was nothing sensational in the occurrences of these two species in 1959.

Of native plants, the only really outstanding record was the magnificent flowering plant of lady orchid, *Orchis purpurea*, found in Surrey by Miss D. Smith. Although all the stations found were outside our Area, mention should also be made of the important discoveries of a small grass, *Nardurus maritimus*, in Kent, by Mr. and Mrs. Peter Hall at Trottiscliffe, Upper Halling and Hollingbourne. The record from the last-named place was made on a L.N.H.S. field meeting, the first two on chalk on the escarpment of the North Downs. It is likely that careful search will reveal localities for this species further west on this escarpment and within our Area, where there is suitable ground.

The nomenclature used in this report is based on the *List of British Vascular Plants* (1958) prepared by J. E. Dandy, and for species in that list authors' names are omitted in order to save space. The numbers following place names are those of the 10-kilometre squares of the National Grid (for a full explanation see *Lond. Nat.*, 37, 182, 1958).

V.-c. 16, WEST KENT.

Excellent lists for this part of our Area were again contributed by H. M. Pratt. These include a lamb's lettuce, *Valerianella dentata* found by R. Whitbread near Watling Street, south of Stone (57), a hawkbit, *Leontodon taraxacoides* found by Mr. Pratt in a playing field at Stone (57), and a medick, *Medicago minima* reported by R. Whitbread in 1958 from the top of the river wall on Stone Marshes (57). A specimen of a garden weed at Bromley (46) collected by S. N. A. Jacobs has been determined by Dr. A. Melderis as *Amaranthus spinosus* L. Following a recent revision of the Australian storksbills, the specimens recorded in the *Hand List* (p. 49) as *Erodium cygnorum* Nees collected from Hextable (57) in 1948 and 1949, have now been redetermined by Dr. R. Melville as the recently described species *E. crinitum* Carolin (*Proc. B.S.B.I.*, 3, 284-5, 1959).

V.-c. 17, SURREY.

The lady orchid, *Orchis purpurea*, is one of the finest of British plants, and the one shown to Dr. D. P. Young and myself in the Limpsfield area

(35) by Miss D. Smith on May 22 had flowers of an exceptionally rich colour. She found it in 1958 and sent a labellum to the Botany School at Cambridge where it was named. Dr. F. Rose has determined as *Oenanthe pimpinelloides* a specimen collected from a ditch near Chessington (16) by K. Page and we are grateful to Miss P. A. Hitch for sending us this record. The habitat is an unusual one as the species usually grows in dry pastures.

Records communicated by Dr. D. P. Young include round-leaved crane's-bill, *Geranium rotundifolium*, from roadsides in and near Croham Road, Croydon (36), found by L. J. Jerrard, and a shrub, *Berberis glaucocarpa* Stapf noticed in a field hedge at Godstone (35) in 1957 during a field meeting of the Holmesdale Natural History Society. Dr. Young also reported three interesting weeds from Mizen's nurseries at Ewell (26) — English bedstraw, *Galium parisiense*, and purslane, *Portulaca oleracea*, found by himself, and an alien dodder, *Cuscuta campestris* Yuncker (det. at Kew) found by A. E. Ellis. At Godstone Town Pond (35) golden dock, *Rumex maritimus*, appeared "in astronomical quantity" and was reported by Dr. Young and others. *Lagarosiphon major*, an alien water weed which is being spread by aquarists, turned up in a pond on Godstone Green (35), whence Miss E. M. Isherwood was the first to report it. This species is now known from five ponds in Surrey within the L.N.H.S. area, and at least two others in the county outside our area.

A rare hawksbit, *Crepis setosa*, was mentioned in last year's report as found in 1958 near Cobham, and it is now known that in the same year it was also found near Watermeads, Mitcham (26) by R. C. Wingfield whose specimen was determined by D. P. Young. One of the less frequent species of thorn-apple, *Datura ferox* L., was collected near a chicken run in King's Farm Avenue, Richmond (17), by Mrs. R. Pope and named by Dr. A. Melderis. While on the subject of aliens, it seems advisable to put on record that a considerable number of species grown in gardens have been planted along the sides of a track and two lanes below Gravelly Hill near Surrey Crest (35). As several of these have been reported in recent years, Dr. Young and I visited the site independently during the summer and are agreed that these hortal plants are growing under conditions where they are so obviously planted that their occurrence is of little or no botanical interest and they should not be included in the records. Although in a garden, the record of *Cotula dioica* Hook. f. as a weed in a lawn at Clive Road Esher (16) reported by Mrs. J. E. Smith is of greater interest since the present owners have been trying to get rid of it for 13 years.

On Banstead Heath (25) F. G. Fuller showed me a ladies' mantle, *Alchemilla xanthochlora*, growing with twayblades and adder's tongue. Our only previous record for this species from Surrey is from Wimbledon Common where it was regarded as almost certainly adventive. It is possible that it was also introduced at Banstead but, if so, it is difficult to suggest a plausible explanation unless a horse had taken in the seeds with its food and voided them on the track where the plant now grows. On a hedgebank near Buckland (25) F. D. S. Richardson showed me a lamb's lettuce, *Valerianella carinata*, and in a small dry chalkpit on the slope of Colley Hill (25) I found a marsh-orchid, *Dactylorhizis praetermissa*, for which most of our other records are from damp places. The habitat for the small birthwort, *Aristolochia rotunda* at Southawke (35) has changed greatly since the photograph reproduced in the *Hand List* was taken.

At that time the plant was growing in chalk grassland, but by 1959 a colonization by trees and shrubs had proceeded so far that the two patches of birthwort were in what was virtually woodland, and it seemed likely that they would be destroyed. The opportunity was therefore taken to clear away some of the trees and scrub when the Conservation Corps of the Council for Nature were working at Southawke in the autumn, and it is hoped that this will enable *Aristolochia rotunda* to survive.

V.-c. 18, SOUTH ESSEX.

Very valuable additions to our records for South Essex have been made this year by S. T. Jermyn. The long lists he has contributed have been particularly helpful in filling gaps in the Brentwood district. They include wood club-rush, *Scirpus sylvaticus*, and wood horsetail, *Equisetum sylvaticum*, from South Weald Park (59), and Solomon's Seal, *Polygonatum multiflorum*, and several very well established hortal species, such as an ivy, *Hedera colchica* K. Koch, and an arum, *Arum neglectum*, from Warley Place (59).

From Little Park near Brentwood (69) R. M. Payne reports fine plants of lady fern, *Athyrium flix-femina* (one frond was 4 feet, 8 inches long), and *Dryopteris borreri*. He points out that the record of *Equisetum sylvaticum* from "Lower Epping Forest" printed in the *Hand List* for V.-c. 19 should almost certainly be corrected to V.-c. 18. Mr. Payne has found a huge colony of this horsetail on Coopersale Common (40), and comparison with other species known to grow there shows that R. W. Robbins and his contemporaries referred to this locality as "Lower Forest," and P. H. Cooke is likely to have done the same.

V.-c. 20, HERTS.

Additional records have been contributed by A. Vaughan. These include mistletoe, *Viscum album*, by the River Lea in Hatfield Park (20), 13 plants of broad-leaved helleborine, *Epipactis helleborine*, in Great Wood, Cuffley (20), and ivy-leaved duckweed, *Lemna trisulca*, from Broxbourne Woods (30).

V.-c. 21, MIDDLESEX.

Sea plantain, *Plantago maritima*, is a species which one expects to find in southern England only on the coast but D. E. Allen reports two plants he found growing on gravel by the bowling green in Hyde Park (28). There it was no doubt an introduction similar to the occurrence on Wimbledon Common in 1924 where the plant was thought to have been brought in with turf, and "Cumberland turf" which comes from the coast, should be examined elsewhere to see if it contains sea plantain which persists.

In Kensington Gardens, near the Lily Ponds (27) Mr. Allen collected specimens of a hybrid willow-herb, *Epilobium montanum* X *roseum*, which were confirmed by the late G. M. Ash. In such a dry summer it might have been expected that the little sedge, *Cyperus fuscus*, which grows on exposed mud, would have appeared in quantity in the locality near Staines (07) which was discovered in July, 1957. It was therefore puzzling when several searches during the summer failed to reveal any plants at all, but they evidently germinated very late, as R. A. Boniface in October was successful in finding over 50 small plants.

Three interesting aliens found on a rubbish tip on Hounslow Heath (17) by Mrs. D. Bennett were determined for her at Kew—*Colocynthis citrullus* (L.) O. Kuntze, *Physalis ixocarpa* Hornem., and *Cotoneaster lindleyi*

Steud. P. R. Knipe reports six non-flowering plants of lilies-of-the valley, *Convallaria majalis*, from Harrow Weald Common (19), and lesser meadow-rue, *Thalictrum minus*, from the same place in 1958 when it was no doubt a garden escape. On the river wall near Hampton Court (16) in 1958 he found Norway maple, *Acer platanoides*, and Shasta daisy, *Chrysanthemum maximum*, which is becoming increasingly established in waste places. In a cornfield near Scratch Wood, Edgwarebury (29) he found sharp-leaved fluellen, *Kicksia elatine*. F. C. Studley reported three plants of a spurge, *Euphorbia dulcis*, growing through a crack in concrete at the top of Harrow Hill (18)—this was the first time this species had been brought to our notice in the London Area though the Harrow locality was known previously to R. M. Harley. From a grass verge in Maxted Park and waste ground in Roxborough Park, Harrow (18) Mr. Studley noted *Tellima grandiflora*. He also found a most interesting pearlwort with pentamerous flowers on lawns, verges and neglected graves in the cemetery, Pinner Road, Harrow (18). This is allied to *Sagina glabra* (Willd.) Fenzl but the precise identification is still being investigated in connection with similar plants found elsewhere. It is hoped that members will send specimens to the recorder of any pearlworts they find round London with 5 petals.

On Primrose Hill (28) a small patch of *Cyperus rotundus*, which was growing in grass, and doubtless a relic of someone's feast of tiger nuts, was found by D. H. Kent. He also reports spotted dead-nettle, *Lamium maculatum*, as well established on waste ground at Hanwell (17). Occurring as weeds in a garden at West Ealing (17) where sweepings are spread as a manure from an outdoor aviary used for breeding budgerigars, Mr. Kent found a number of Mediterranean species of which the seeds had been brought in as impurities in bird-seed. A list of these is being published elsewhere (*Proc. B.S.B.I.*, 3, 442, 1960) and the rarer species included *Medicago minima* (L.) Bartal., *Malope trifida* Cav., *Ononis salzmanniana* Bois. & Reut., *Convolvulus tricolor* L., *Lolium rigidum* Gaud., and *Brachypodium distachyrum* (L.) P. Beauv.

V.-c. 24, BUCKS.

During the year we have received some very welcome additions to our records for the small portion of this county within the London Area. Three species not previously recorded were found by I. G. Johnson in 1958—bog-bean, *Menyanthes trifoliata*, and cotton-grass, *Eriophorum angustifolium*, from water meadows near Denham (08) and *Montia perfoliata* from Denham Golf Club Halt (08). Small Teasel, *Dipsacus pilosus*, has been added to our records by P. R. Knipe from near Priory Covert, Denham (08), who also found golden saxifrage, *Chrysosplenium oppositifolium*, in Northmoor Hill Wood (08).

We are grateful to the following for their contributions during the year:—D. E. Allen, the late G. M. Ash, Mrs. D. Bennett, R. A. Boniface, R. Clarke, A. E. Ellis, F. G. Fuller, Mr. and Mrs. P. Hall, R. M. Harley, Miss P. A. Hitch, Miss E. M. Isherwood, S. N. A. Jacobs, S. T. Jermyn, L. J. Jerrard, I. G. Johnson, D. H. Kent, P. R. Knipe, G. A. Matthews, Dr. A. Melderis, Dr. R. Melville, E. Milne-Redhead, K. Page, J. R. Palmer, D. A. Paull, R. M. Payne, Mrs. R. Pope, H. M. Pratt, F. D. S. Richardson, Dr. F. Rose, Miss D. Smith, Mrs. J. E. Smith, F. C. Studley, J. B. Tatum, Miss I. Thornley, A. Vaughan, P. J. Wanstall, Mrs. B. Welch, R. Whitbread, Miss W. P. White, K. White, R. C. Wingfield, Dr. D. P. Young.

A Contribution to the Flora of Central London

By DOUGLAS H. KENT

THE flora of the London Area has never been adequately described although contributions on the subject have been made by various authors (Curtis, 1775-98; Cooper, 1836-37; Irvine, 1838; Crespigny, 1877 and Kent and Lousley, 1951-57). These accounts, however, cover areas of up to 30 miles, and more, from the centre of the City. It appears then, that apart from lists of adventive plants found growing on the site of the International Exhibition of 1862 at South Kensington (now occupied by the British Museum [Natural History]) in the 1870's (Dyer 1871 and 1872, and Warren, 1875), accounts of the wild flora of Hyde Park and Kensington Gardens (Warren, 1871 and 1875A, and Kent, 1950), Regents Park (Webster, 1911) and Battersea Park (Johnson, 1910); two papers on the vegetation of London building sites (Shenstone, 1910 and 1912) and comparatively recent studies on the flora of bombed sites (Lousley, 1944, 1946 and 1953; Wrighton, 1950, and Jones, 1958), little attempt has been made to investigate and list the plant taxa which occur in Central London.

This account consists of records made since 1939 by the author and various friends and correspondents in an area with a $2\frac{1}{2}$ mile radius from Piccadilly Circus. A number of records from literature have also been included.

Commencing in the west the boundary of the area crosses Kensington Church Street and proceeds in a clockwise direction through Bayswater, Paddington and St. John's Wood to Primrose Hill, thence continuing through Camden Town, Dalston, Islington and Hoxton to Liverpool Street station and the Tower of London. The boundary then crosses the Thames and proceeds through Bermondsey, Walworth and Camberwell to Battersea, where it re-crosses the river between Battersea Bridge and Albert Bridge and continues through Chelsea and Brompton to Kensington Church Street.

Most of the area has been almost entirely built-up for well over a century and would scarcely be expected to support more than a small and sporadic weed flora. It does, however, contain a number of open spaces, the most important of which are Regents Park (470 acres), Hyde Park (360 acres), Kensington Gardens (275 acres), Green Park (53 acres), St. James's Park (93 acres), Buckingham Palace grounds and Battersea Park (200 acres). In addition there are the many squares, with their private gardens and shrubberies, in the Westminster, Belgravia, Pimlico, Chelsea and Kensington districts, as well as gardens, railway banks, permanent way and yards, the banks and river-walls of the Thames, and various canals. These places provide, or have provided, sanctuary for nearly 400 plant taxa, mostly species, including many natives.

The whole area has been subjected to prolonged disturbance by man and consists entirely of artificial habitats. As a result weed species are predominant, while aquatic and woodland species are uncommon and marsh plants rare.

The common weed species of flower beds and shrubberies in the parks and squares include *Epilobium montanum*, *Circaeа lutetiana*, *Aethusa cynapium*, *Euphorbia peplus*, *Polygonum persicaria*, *P. convolvulus*, *Urtica urens*, *Solanum dulcamara*, *S. nigrum*, *Galinsoga parviflora*, *G. ciliata*, *Senecio vulgaris*, *Lapsana communis*, *Sonchus oleraceus* and *Taraxacum*

officinale. The most frequent weeds of lawns and turf are *Ranunculus repens*, *Trifolium repens*, *Plantago major*, *Bellis perennis* and *Achillea millefolium*. The trampled muddy areas of the parks frequently provide large quantities of *Capsella bursa-pastoris*, *Polygonum aviculare* sens. lat. and *Matricaria matricarioides*.

Taxa commonly found on the banks and paths of the canals and Thames include *Malva sylvestris*, *Epilobium hirsutum*, *Ballota nigra*, *Lycopus europaeus*, *Scutellaria galericulata*, *Senecio squalidus*, *Tripleurospermum maritimum* subsp. *inodorum*, *Matricaria recutita* and *Arctium minus*.

Aquatic species found in the canals and ponds include *Potamogeton crispus*, *P. pectinatus* and *Zannichellia palustris*.

The few woodland species found in the area include *Silene dioica*, *Rumex sanguineus*, *Festuca gigantea*, *Poa nemoralis* and *Melica uniflora*.

Common plants which do not appear to have been seen in Central London since 1939 are *Stellaria holostea*, *Callitricha stagnalis*, *Chaerophyllum temulentum*, *Bryonia dioica* and *Mentha aquatica*.

In the list which follows taxa are listed only from habitats which are unlikely to be built on, and for this reason plants from bombed sites are excluded, though a list of taxa recorded from bombed sites but not noted in other habitats in the area will be found at the end of this paper. Species which are known to have been deliberately planted by lakes and on railway banks for decorative and other purposes are also omitted unless they have shown themselves capable of regenerating. The nomenclature and order used is based on that of Dandy (1958). The following signs are used:—

* Plant merely casual.

† Plant of foreign, or cultivated origin.

‡ Following a locality indicates that the plant has been seen there by the author; ‡ following a recorder's initials indicates that the record was made in company with the author.

I am indebted to many friends and correspondents who have provided records, and special thanks must be offered to D. E. Allen for data on Hyde Park and Kensington Gardens plants, H. C. Holme for notes from Regents Park and Marylebone and D. McClintock for records from the Westminster area. The records from Buckingham Palace grounds were made in the company of Lt.-Col. J. C. Codrington, J. E. Lousley and D. McClintock, except where otherwise stated. Records not followed by a recorder's initials were made by the author.

D. E. Allen, J. E. Lousley and D. McClintock also kindly read and commented on the typescript of this paper. The author would be grateful for additional records.

INDEX TO RECORDERS' NAMES

A.B.	Braybon, Mrs. A.	F.D.	Druce, F.
A.C.J.	Jermy, A. C.	G.M.A.	Ash, G. M.
A.H.G.A.	Alston, A. H. G.	G.M.G.	Gibson, Mrs. G. M.
A.J.W.	Wilmott, A. J.	H.C.H.	Holme, H. C.
B.W.	Welch, Mrs. B.	I.W.D.	Davies, Mrs. I. W.
C.W.	West, Dr. C.	J.B.E.	Evans, J. B.
D.E.A.	Allen, D. E.	J.C.C.	Codrington, Lt.-Col. J. C.
D.McC.	McClintock, D.	J.E.L.	Lousley, J. E.
D.M.E.	Eastwood, Mrs. D. M.	K.E.B.	Bull, K. E.
D.P.Y.	Young, Dr. D. P.	L.D.P.	Parsons, Dr. L. D.
E.B.B.	Bangerter, E. B.	L.G.P.	Payne, L. G.
E.S.E.	Edees, E. S.	L.J.T.	Tremayne, L. J.

INDEX TO RECORDERS' NAMES *continued*

N.Y.S.	Sandwith, N. Y.	R.C.L.B.	Burges, Dr. R. C. L.
P.D.S.	Sell, P. D.	R.S.R.F.	Fitter, R. S. R.
P.R.K.	Knipe, P. R.	W.G.T.	Teagle, W. G.
R.A.G.	Graham, R. A.	W.J.L.S.	Sladen, Dr. W. J. L.

PTERIDOPHYTA

SPHENOPSIDA

EQUISETACEAE

EQUISETUM ARVENSE L. *Common Horsetail*. Buckingham Palace grounds. Eaton Square, S.W.1. Portland Place, W.1, H.C.H. Lambeth, *Ager*.

PTEROPSIDA

DENNSTAEDTIACEAE

PTERIDIUM AQUILINUM (L.) Kuhn. *Bracken*. Sporelings are rather common on walls and other brickwork; mature plants are less common but also occur in shady places in the parks and squares and on canal and railway banks.

ASPLENIACEAE

PHYLLITIS SCOLOPENDRIUM (L.) Newm. *Hartstongue*. Very rare. Basement wall, Gillingham St., S.W.1, 1957, R.S.R.F. Old Wall, Circus Road, N.W.8, 1958.

ASPIDIACEAE

DRYOPTERIS FILIX-MAS (L.) Schott. *Male Fern*. Sporelings are common on walls and other brickwork; mature plants are uncommon but have been noted at Hyde Park‡; Kensington Gardens‡, D.E.A. Buckingham Palace grounds.

ANGIOSPERMAE

DICOTYLEDONES

RANUNCULACEAE

*†DELPHINIUM ORIENTALE Gay. S. Europe. Garden escape. Eaton Square, S.W.1, one plant, 1958, D.McC. Eccleston Square, S.W.1, 1958-59.

CLEMATIS VITALBA L. *Traveller's Joy*. Rare. Gordon Square, W.C.1. Portugal St., W.C.2, 1950. Wellington Road, N.W.8. Duke of York's Headquarters, King's Road, S.W.3. Near Lambeth Palace, 1946, *Ager*. Nine Elms Goods Depot, Battersea, 1959.

RANUNCULUS ACRIS L. *Meadow Buttercup*. Rather common in the parks and squares. Lambeth, *Ager*.

R. REPENS L. *Creeping Buttercup*. Common in the parks and squares and as a weed of gardens and cultivated ground.

R. BULBOSUS L. *Bulbous Buttercup*. Rare. Hyde Park. Regents Park, H.C.H. Lord's Cricket Ground. Ranelagh Gardens, S.W.3.

R. SCELERATUS L. *Celery-leaved Crowfoot*. Rare. By the Serpentine, Hyde Park‡ and Kensington Gardens‡, D.E.A.

R. FICARIA L. *Lesser Celandine*. Very rare. Kensington Gardens.

CERATOPHYLLACEAE

CERATOPHYLLUM SUBMERSUM L. *Honewort*. Very rare. British Medical Association's pond, Tavistock Square, W.C.1, R.C.L.B., Lousley (1948). Perhaps introduced by the agency of water fowl.

PAPAVERACEAE

PAPAVER RHOEAS Ll *Common Poppy*. Canal path near Paddington, 1948. Eaton Square, S.W.1, 1956, D.McC. Hyde Park, 1958, D.E.A. Imperial War Museum site, Lambeth, *Ager*.

*†P. SOMNIFERUM L. *Opium Poppy*. S. Europe. Garden escape. St. James's Park, 1939, L.J.T. Regents Park, 1957, H.C.H. Hyde Park, 1959, D.E.A.

CHELIDONIUM MAJUS L. *Greater Celandine*. Rare. Garden weed, St. John's Wood, 1957, H.C.H.

FUMARIACEAE

† CORYDALIS LUTEA (L.) DC. *Yellow Corydalis*. S. Europe. Garden escape. Old wall, Elm Tree Road, N.W.8, 1958.

* FUMARIA OFFICINALIS L. *Common Fumitory*. Eaton Square, S.W.1, 1958, D.McC. Imperial War Museum site, Lambeth, *Ager*.

CRUCIFERAE

* BRASSICA NAPUS L. *Rape*. Camberwell. By Waterloo Station, 1959.

*†B. JUNCEA (L.) Czern & Coss. Asia. Hyde Park, 1947.

*†B. INTEGRIFOLIA var. CARINATA (A. Braun) O. E. Schulz. N.-E. Africa. Air raid shelter, Chelsea Embankment Gardens, 1941, F.D. & N.Y.S., J. Bot., 79, 86. Trinity Gardens, E.C.3, 1950-51, J.E.L. This species is imported into Europe for oil extraction purposes.

*†RHYNCHOSINAPIS CHEIRANTHOS (Vill.) Dandy. S. & Central Europe. By the lake, Regents Park, a few plants, 1957, H.C.H., *Lousley* (1958).

* SINAPIS ARvensis L. *Charlock*. Common on disturbed ground.

* S. ALBA L. *White Mustard*. Rare. Hyde Park. Kensington Gardens. Elephant and Castle; Westminster Bridge Road, S.E.1, *Ager*.

DIPIOTAXIS MURALIS (L.) DC. *Wall Rocket*. Railway tracks, Victoria station. Lambeth. Battersea.

D. TENUIFOLIA (L.) DC. *Perennial Wall Rocket*. Railway side, Camberwell, 1959. Railway embankment, South Bermondsey, 1959, J.E.L.

* RAPHANUS RAPHANISTRUM L. *Wild Radish*. Buckingham Palace grounds, 1956. Regents Park, 1956, H.C.H. River wall, Battersea Park, 1959.

*†RAPISTRUM RUGOSUM (L.) All. Mediterranean region. Near the Gorilla House, Zoological Gardens, Regents Park, *Shove*. Frequently introduced with cage-bird seed.

*†LEPIDIUM RUDERALE L. *Narrow-leaved Cress*. Roadside near Waterloo station, 1953.

CORONOPUS SQUAMATUS (Forsk.) Aschers. *Swine-cress*. Kensington Gardens. Hyde Park, D.E.A. Green Park. Regents Park, H.C.H. Kings Cross. Buckingham Palace grounds.

† C. DIDYMUS (L.) Sm. *Lesser Swine-cress*. S. America. Buckingham Palace grounds, 1956. Regents Park, H.C.H. Hyde Park, Kensington Gardens‡ and St. James's Park, D.E.A.

† CARDARIA DRABA (L.) Desv. *Hoary Pepperwort*. Europe. Primrose Hill.

* THLASPI ARVENSE L. *Field Penny-cress*. Regents Park; St. Marylebone, 1957, H.C.H.

CAPSELLA BURSA-PASTORIS (L.) Medic. *Shepherd's Purse*. Very common.

† ARMORACIA RUSTICANA Gaertn., Mey. & Scherb. *Horse-radish*. S.-E. Europe and W. Asia. Escape from cultivation. Kensington Gardens‡, D.E.A. Paddington. Primrose Hill. Battersea. Railway embankment, South Bermondsey, J.E.L.

CARDAMINE PRATENSIS L. *Lady's Smock*. Very rare. Regents Park, H.C.H.

C. FLEXUOSA With. *Wood Bitter-cress*. Very rare. Kensington Gardens, 1949.

C. HIRSUTA L. *Hairy Bitter-cress*. Rare. St. John's Wood, 1957, H.C.H. Regents Park. Kensington Gardens, D.E.A.

BARBAREA VULGARIS R.Br. *Winter Cress*. Very rare. Regents Park.

RORIPPA SYLVESTRIS (L.) Bess. *Creeping Yellow-cress*. Regents Park‡, H.C.H. Hyde Park. Kensington Gardens‡, D.E.A. Primrose Hill.

R. ISLANDICA (Oeder) Borbás. *Marsh Yellow-cress*. Sloane Square, 1947. Regents Park, A.H.G.A. In crack of terrace by Buckingham Palace. Kensington Gardens. Hyde Park‡, D.E.A. Battersea Park.

*†HESPERIS MATRONALIS L. *Dame's Violet*. S. Europe. Garden escape. Hyde Park, 1940, G.M.G. Regents Park, 1956, H.C.H.

ERYSIMUM CHEIRANTHOIDES L. *Treacle Mustard*. Kensington Gardens. Russell Square, W.C.1, 1947. Regents Park‡, H.C.H. Ebury Street, S.W.1, 1946-48, D.McC. Eaton Square, 1956 and 1958, D.McC. St. James's Park, D.E.A. Green Park. Battersea Park. By Regents Canal, St. Pancras, N.W.1, 1959.

ALLIARIA PETIOLATA (Bieb.) Cavara & Grande. *Jack-by-the-hedge*. Rare. Regents Park. Battersea Park.

SISYMBRIUM OFFICINALE (L.) Scop. *Hedge Mustard*. Common. The var. LEIOPARON DC. occurred in Regents Park in 1951.

† S. IRIO L. *London Rocket*. S. Europe. Very rare. Trinity Square, E.C.3‡, 1954, Mrs. EVETTS. Tower of London gardens‡, and elsewhere, 1959, J.E.L. Regents Park‡, H.C.H.

† S. LOESELII L. S.-E. Europe. Russell Square, W.C.1, where it has persisted for nearly 50 years.

*†S. ORIENTALE L. *Eastern Rocket*. Europe. Near Mornington Crescent, N.W.1, 1956, H.C.H. Regents Park, 1957, H.C.H.

† S. ALTISSIMUM L. *Tumbling Mustard*. E. Europe. Near Mornington Crescent, N.W.1, 1956, H.C.H.

*†S. STRICTISSIMUM L. Europe. Belgrave Square, S.W.1, 1945‡, Lt.-Col. CONGREVE teste B.W.; in quantity, 1945, J.E.L. Perhaps originally planted.

RESEDACEAE

RESEDA LUTEOLA L. *Dyer's Rocket*. Coalyard near Paddington station, 1950. Kensington Gardens, 1958‡, D.E.A.

R. LUTEA L. *Wild Mignonette*. Railway side near Paddington. Camberwell.

*†R. ALBA L. *White Mignonette*. Mediterranean region. Garden Escape. Chelsea Square, S.W.3, 1947, R.A.G. Grounds of Natural History Museum, S. Kensington, 1948, E.B.B. and J.B.E.

VIOLACEAE

* VIOLA ARVENSIS Murr. *Field Pansy*. Eaton Square, S.W.1, 1954 D.McC., Lousley (1955); 1958, D.McC.

GUTTIFERAE

HYPERICUM PERFORATUM L. *Common St. John's Wort*. Very rare. Regents Park‡, H.C.H.

H. TETRAPTERUM Fr. *Square-stemmed St. John's Wort*. Very rare. Regents Park, 1956, H.C.H.

CARYOPHYLLACEAE

SILENE VULGARIS (Moench) Garcke. *Bladder Campion*. Kensington Gardens. Hyde Park, D.E.A. Canal bank near Paddington Basin.

S. DIOICA (L.) Clairv. *Red Campion*. Rare. Bird Sanctuary, Hyde Park. Regents Park.

S. ALBA (Mill.) E. H. L. Krause. *White Campion*. Canal bank, Paddington. Kensington Gardens. Hyde Park, D.E.A. Regents Park. Buckingham Palace grounds. Eaton Square, S.W.1, 1958, D.McC. Ranelagh Gardens, S.W.3. Kennington. Lambeth, *Ager*. Elephant and Castle.

† SAPONARIA OFFICINALIS L. *Soapwort*. Europe. Garden escape. Nine Elms Goods Depot, Battersea, 1959.

CERASTIUM HOLOSTEOIDES Fr. *Common Mouse-ear Chickweed*. Common on waste ground and in grassy places.

C. GLOMERATUM Thuill. *Sticky Mouse-ear Chickweed*. Rare. Regents Park, 1958‡, H.C.H.

STELLARIA MEDIA (L.) Vill. *Chickweed*. Very common.

S. PALLIDA (Dumort.) Piré. *Lesser Chickweed*. Very rare. Regents Park, 1957, H.C.H., *Lousley* (1958).

SAGINA PROCUMBENS L. *Procumbent Pearlwort*. Common at wall bases, on paths and in crevices between paving stones.

MOEHRINGIA TRINERVIA (L.) Clairv. *Three-nerved Sandwort*. Rare. Hyde Park, 1947.

ARENARIA SERPYLLIFOLIA L. *Thyme-leaved Sandwort*. Rare. Regents Park. Eaton Square, S.W.1, 1958, D.McC.

PORTULACACEAE

† MONTIA PERfoliata (Willd.) Howell. *Perfoliate Claytonia*. N. America. Weed of flower-beds, Albert Embankment Gardens, Chelsea, 1953, D.McC. Weed of flower-beds, Buckingham Palace grounds, 1957, D.McC. Weed in shrubbery, Hyde Park, 1959, D.E.A.

† M. SIBIRICA (L.) Howell. N. America. Garden weed, St. John's Wood, 1955, H.C.H.

AMARANTHACEAE

*†AMARANTHUS RETROFLEXUS L. N. America. Tower of London gardens, J.E.L.

CHENOPodiACEAE

CHENOPodium POLYSPERMUM L. *All-seed*. A common weed of flower-beds in the parks.

C. ALBUM L. *White Goosefoot*. Common.

C. FICIFOLIUM Sm. *Fig-leaved Goosefoot*. Hyde Park, D.E.A. Kensington Gardens. Buckingham Palace grounds. Primrose Hill. Battersea Park.

C. MURALE L. *Nettle-leaved Goosefoot*. Rare. Derelict garden, Pimlico, 1956, J.C.C. Ranelagh Gardens, S.W.3, in quantity, 1959.

C. RUBRUM L. *Red Goosefoot*. Rare. Kensington Gardens. St. Pancras Depot. Car park, St. Thomas's Hospital, S.E.1, 1959.

ATRIPLEX PATULA L. *Common Orache*. Regents Park. Kensington Gardens, D.E.A. Eaton Square, 1958, D.McC. Buckingham Palace grounds.

A. HASTATA L. *Hastate Orache*. Common.

MALVACEAE

MALVA SYLVESTRIS L. *Common Mallow*. Common.
 M. NEGLECTA Wallr. *Dwarf Mallow*. Green Park, Regents Park.
 Kensington Gardens, D.E.A. Battersea Park.
 *†M. PUSILLA Sm. Europe. Eaton Square, S.W.1, a single large plant, 1958, D.McC.

LINACEAE

*†LINUM USITATISSIMUM L. *Cultivated Flax*. N. Africa. Hyde Park, 1958;
 Kensington Gardens, 1958, D.E.A. Introduced with cage-bird seed.

GERANIACEAE

GERANIUM PRATENSE L. *Meadow Cranesbill*. Regents Park, 1957,
 H.C.H.
 † G. SANGUINEUM L. *Bloody Cranesbill*. Garden escape. Regents Park,
 H.C.H.
 † G. MACRORRHIZUM L. Europe. Garden escape. Regents Park, H.C.H.
 G. PYRENAICUM Burm. f. *Mountain Cranesbill*. Very rare. Waste
 ground, Eccleston St., S.W.1, 1957, J.C.C.
 G. DISSECTUM L. *Cut-leaved Cranesbill*. Rare. Kensington Gardens, 1948.
 G. MOLLE L. *Dove's-foot Cranesbill*. Regents Park. Buckingham
 Palace grounds. Hyde Park‡, D.E.A. Imperial War Museum site,
 Lambeth, one plant, 1946, Ager.
 G. PUSILLUM L. *Small-flowered Cranesbill*. Very rare. Hyde Park.
 1946, B.W.

TROPAEOLACEAE

*†TROPAEOLUM PEREGRINUM L. *Canary Creeper*. New Granada. Garden
 outcast. Doverhouse Street, S.W.3, 1957, R.A.G.

OXALIDACEAE

† OXALIS CORNICULATA L. *Procumbent Yellow Sorrel*. Tropics. Garden
 pest, St. John's Wood, 1956, H.C.H.
 † O. CORYMBOSA DC. S. America. Weed of flower-beds, Hyde Park‡ and
 Kensington Gardens‡, D.E.A. Flower-bed weed, Buckingham Palace
 grounds. Garden weed, St. John's Wood, H.C.H. Garden weed,
 Paddington. Eaton Square, S.W.1, 1958, D.McC. Chelsea Hospital
 grounds.

BALSAMINACEAE

† IMPATIENS PARVIFLORA DC. *Small Balsam*. Siberia. Regents Park,
 common. Abundant on platform of disused St. John's Wood
 station, 1958, P.R.K. Garden weed, Basil St., S.W.3, D.McC.
 † I. GLANDULIFERA Royle. *Himalayan Balsam*. Himalaya. Garden escape.
 By railway near Paddington‡, K.E.B. Primrose Hill, H.C.H. Plentiful
 by Regents Canal, Islington.

SIMAROUBACEAE

† AILANTHUS ALTISSIMA (Mill.) Swingle. *Tree of Heaven*. China. A fre-
 quently planted tree in central London. Seedlings and saplings are
 common in the squares and on waste ground in Bloomsbury, Bel-
 gravia, Pimlico and Kensington.

ACERACEAE

† ACER PSEUDOPLATANUS L. *Sycamore*. Europe. A frequently planted
 tree in central London. Self-sown seedlings and saplings are common
 in the parks and squares.

HIPPOCASTANACEAE

† *AESCULUS HIPPOCASTANUM* L. *Horse-chestnut*. S.-E. Europe. A common tree in the parks. Self-sown seedlings are uncommon but have been noted in Hyde Park, Kensington Gardens and Buckingham Palace grounds.

AQUIFOLIACEAE

ILEX AQUIFOLIUM L. *Holly*. Planted in the parks and squares. Self-sown seedlings are very rare and have been noted only in Kensington Gardens†, D.E.A.

RHAMNACEAE

RHAMNUS CATHARTICUS L. *Purging Buckthorn*. Buckingham Palace grounds, one bush; perhaps planted.

VITACEAE

† *VITIS VINIFERA* L. *Vine*. S. Europe. Regents Park, 1954, H.C.H. Either bird-sown or the result of a rejected grape stone.

LEGUMINOSAE

† *LABURNUM ANAGYROIDES* Medic. *Laburnum*. S. Europe. Planted in the squares and parks where self-sown seedlings and saplings occur freely.

† *MEDICAGO SATIVA* L. *Lucerne*. Mediterranean region. Kensington Gardens. Primrose Hill. Nine Elms Goods Depot, Battersea. Cultivated as a fodder crop.

M. LUPULINA L. *Black Medick*. Common.

† *MELILOTUS OFFICINALIS* (L.) Pall. *Common Melilot*. Europe. Hyde Park, 1947. Eaton Square, 1958, D.McC. Walworth. Camberwell.

*† *M. ALBA* Medic. *White Melilot*. Europe. Hyde Park, 1947. Regents Park, 1956, H.C.H.

*† *M. INDICA* (L.) All. *Small-flowered Melilot*. Mediterranean region. Chelsea, 1954.

*† *TRIGONELLA FOENUM-GRAECUM* L. Mediterranean region. Flower-bed weed, Chelsea Embankment Gardens, 1955, D.P.Y., *Lousley* (1956).

TRIFOLIUM PRATENSE L. *Red Clover*. Common.

T. MEDIUM L. *Zigzag Clover*. Very rare. Regents Park.

† *T. HYBRIDUM* L. *Alsike Clover*. Europe. Canal path, Paddington. Kensington Gardens. Buckingham Palace grounds. Camberwell. Battersea.

T. REPENS L. *White Clover*. Very common.

T. FRAGIFERUM L. *Strawberry Clover*. Coach Mound, Lord's Cricket Ground; destroyed by the building of the new Warner Stand in 1957. Regents Park, H.C.H.

T. DUBIUM Sibth. *Lesser Yellow Trefoil*. Hyde Park. Kensington Gardens, D.E.A. Camberwell.

LOTUS CORNICULATUS L. *Bird's-foot Trefoil*. Buckingham Palace grounds. Hyde Park, D.E.A and D.McC. Kensington Gardens†, D.E.A. Paddington. St. John's Wood. Kennington. Battersea Park.

† *GALEGA OFFICINALIS* L. *Goat's Rue*. Europe. Garden escape. Regents Park, H.C.H. Primrose Hill.

† *ROBINIA PSEUDOACACIA* L. *Acacia*. N. America. Planted in parks and squares. Self-sown seedlings have been noted at Regents Park, Kensington Gardens and Buckingham Palace grounds.

- * *ORNITHOPUS PERPUSILLUS* L. *Birdsfoot*. Flower-bed weed, Buckingham Palace grounds, 1956, D.M.C.C.
- VICIA HIRSUTA* (L.) Gray. *Hairy Tare*. Hyde Park, D.E.A. Kensington Gardens. Eaton Square, S.W.1, 1954, D.M.C.C., *Lousley* (1955); 1958, D.M.C.C. Lord's and Oval Cricket Grounds, 1959.
- V. TETRASPERMA* (L.) Schreb. *Smooth Tare*. Buckingham Palace grounds. Garden weed, St. John's Wood, 1956, H.C.H.
- V. CRACCA* L. *Tufted Vetch*. Hyde Park. Kensington Gardens, D.E.A. Buckingham Palace grounds. Paddington. St. Marylebone. Camden Town. Primrose Hill.
- V. SEPIUM* L. *Bush Vetch*. Rare. Hyde Park.
- V. ANGUSTIFOLIA* L. *Narrow-leaved Vetch*. Rare. Hyde Park.
- * *LATHYRUS APHACA* L. *Yellow Vetchling*. Garden weed, Maida Vale, W.9, 1954.
- L. PRATENSIS* L. *Meadow Vetchling*. Rare. Hyde Park. Buckingham Palace grounds.
- *† *PISUM SATIVUM* L. *Garden Pea*. Near East. Hyde Park, 1958‡, D.E.A. Presumably bird-sown.

ROSACEAE

- RUBUS IDAEUS* L. *Raspberry*. Kensington Gardens‡, D.E.A. Presumably bird-sown.
- R. SEPARINUS* Genev. Kensington Gardens, D.E.A., conf. E.S.E.
- R. ULMIFOLIUS* Schott. Ranelagh Gardens, S.W.3. Chelsea Hospital grounds. Primrose Hill.
- R. PSEUDO-BIFRONS* Sudre. Hyde Park‡ and Kensington Gardens‡, D.E.A., conf. E.S.E.
- † *R. PROCERUS* P. J. Muell. N. America. Garden escape. Brompton, 1959. Kennington, 1959. Lett's Wharf, S.E.1, 1959.
- POTENTILLA ANSERINA* L. *Silverweed*. Buckingham Palace grounds. Hyde Park‡ and Kensington Gardens‡, D.E.A.
- *† *P. RECTA* L. Europe. Garden escape. Air raid shelter, Hyde Park, 1945, B.W. Regents Park, 1955, H.C.H.
- *‡ *P. NORVEGICA* L. Europe. Chelsea Square, S.W.3, 1946, R.A.G. St. Thomas's Hospital grounds, S.E.1, one plant, 1946, *Ager*.
- *‡ *P. INTERMEDIA* L. Europe. Waste ground near Berkeley Square, W.1, 1942, A.H.G.A.
- P. ERECTA* (L.) Räusch. *Tormentil*. Very rare. Kensington Gardens, 1958‡, D.E.A.
- P. ERECTA* X *REPTANS*. Very rare. A large patch on grass at front of Natural History Museum, S. Kensington, 1943, A.J.W. (B.M.) det. D.E.A. Recorded in *Rep. Bot. Soc. & E.C.*, 12, 718, as *P. anglica* Laichard.
- P. REPTANS* L. *Creeping Cinquefoil*. Common.
- GEUM URBANUM* L. *Wood Avens*. Rare. Kensington Gardens‡, D.E.A.
- AGRIMONIA EUPATORIA* L. *Agrimony*. Rare. Hyde Park. Kensington Gardens‡, D.E.A. In turf in front of Waterloo station, 1953.
- APHANES ARVENSIS* L. *Parsley Piert*. Very rare. Buckingham Palace grounds.
- ROSA DUMETORUM* Thuill. *Dog Rose*. Buckingham Palace grounds. Kensington Gardens.
- PRUNUS SPINOSA* L. *Sloe*. Very rare. Kensington Gardens‡, D.E.A.

P. AVIUM (L.) L. *Wild Cherry*. Seedlings are not uncommon on waste ground and in the parks and squares. They originate from discarded "stones" of cultivated cherries and some may be referable to *P. avium* \times *cerasus* and in a few cases to *P. cerasus*.

CRATAEGUS MONOGYNA Jacq. *Hawthorn*. Frequently planted in the parks and squares. Self-sown seedlings have been noted at Hyde Park, D.E.A. Kensington Gardens and Buckingham Palace grounds.

† MALUS SYLVESTRIS subsp. MITIS (Wallr.) Mansf. *Apple*. S.-E. Europe. Seedlings originating from discarded apple cores are not uncommon on waste ground.

CRASSULACEAE

SEDUM ACRE L. *Wall-pepper*. Very rare. Waste ground, Portland Place, W.1, 1955, H.C.H.

GROSSULARIACEAE

RIBES UVA-CRISPA L. *Gooseberry*. Kensington Gardens, one plant, 1958 \ddagger , D.E.A. St. Thomas's Hospital grounds, S.E.1, 1946, *Ager*. Presumably bird-sown from gardens.

ONAGRACEAE

EPILOBIUM HIRSUTUM L. *Great Hairy Willow-herb*. Common.

E. PARVIFLORUM Schreb. *Small-flowered Willow-herb*. Very rare. Near Hyde Park Corner, 1947.

E. MONTANUM L. *Broad-leaved Willow-herb*. A common weed in parks, squares and gardens.

E. MONTANUM \times ROSEUM. Kensington Gardens, 1958 \ddagger , D.E.A. conf. G.M.A.

E. ROSEUM Schreb. *Pale Willow-herb*. Hyde Park. Kensington Gardens \ddagger , D.E.A. Buckingham Palace grounds.

† E. ADENOCAULON Hausskn. N. America. Very common on waste ground and in the parks and squares.

E. OBSCURUM Schreb. Kensington Gardens. Hyde Park. Buckingham Palace grounds. Ranelagh Gardens, S.W.3.

CHAMAENERION ANGUSTIFOLIUM (L.) Scop. *Rosebay Willow-herb*. Very common.

† OENOTHERA BIENNIS L. *Evening Primrose*. N. America. Garden escape. Regents Park. Chelsea. Camberwell.

† O. ERYTHROSEPALA Borbás. N. America. Garden escape. Chelsea, 1959. CIRCAEA LUTETIANA L. *Enchanter's Nightshade*. A common weed of flower-beds and shrubberies in the parks and squares and a persistent weed of gardens.

HALORAGACEAE

MYRIOPHYLLUM SPICATUM L. *Spiked Water-milfoil*. Round Pond, Kensington Gardens \ddagger , D.E.A.; first recorded here over 90 years ago. Lake in Buckingham Palace grounds \ddagger , D.M.E.

ARALIACEAE

HEDERA HELIX L. *Ivy*. Regents Park.

UMBELLIFERAE

HYDROCOTYLE VULGARIS L. *Pennywort*. Marshy edge of lake, Buckingham Palace grounds \ddagger , D.M.E.; perhaps planted.

† ASTRANTIA MAJOR L. Europe. Regents Park, H.C.H.

† *CHAEROPHYLLUM AUREUM* L. Europe. Well established and very abundant in the grounds of Buckingham Palace though no doubt originally planted there. Extending outside the wall of Buckingham Palace grounds, 1959, J.E.L.

ANTHRISCUS SYLVESTRIS (L.) Hoffm. *Cow Parsley*. Kensington Gardens. Regents Park. Hyde Park. Buckingham Palace grounds. Canal side near Paddington. Primrose Hill.

TORILIS JAPONICA (Houtt.) DC. *Upright Hedge-parsley*. Very rare. Kensington Gardens, 1951.

T. NODOSA (L.) Gaertn. *Knotted Hedge-parsley*. Very rare. By the lake, Buckingham Palace grounds.

† *SMYRNIUM PERFOLIATUM* L. S.E. Europe. Burtons Court, S.W.3‡; first reported here by Hon. Mr. Justice Talbot in 1935. Battersea Park, J.E.L.

CONIUM MACULATUM L. *Hemlock*. Very rare. Hyde Park, in two places in turf near Ranger's Lodge, 1959, D.E.A. Camberwell.

SISON AMOMUM L. *Stone Parsley*. Rare. Canal path near Paddington Basin.

*† *CARUM CARVI* L. *Caraway*. Europe. Air raid shelter, Hyde Park, W.J.L.S., Lousley (1945).

CONOPODIUM MAJUS (Gouan) Loret. *Pignut*. Rare. Lawn weed, Burlington Gardens, W.1, 1952. Garden weed, Sloane Square, 1947. Chelsea Hospital grounds.

AEGOPODIUM PODAGRARIA L. *Goutweed*. Kensington Gardens. Regents Park‡, H.C.H. Ranelagh Gardens, S.W.3. Primrose Hill. Kennington.

OENANTHE CROCATA L. *Hemlock Water Dropwort*. Regents Canal, Regents Park. By lake, Buckingham Palace grounds‡, D.M.E. Battersea Park.

AETHUSA CYNAPIUM L. *Fool's Parsley*. A common weed in the parks and squares.

FOENICULUM VULGARE Mill. *Fennel*. Hyde Park, 1950.

ANGELICA SYLVESTRIS L. *Angelica*. River wall, Battersea Park.

HERACLEUM SPHONDYLIUM L. *Hogweed*. Common.

† *H. MANTEGAZZIANUM* Somm. & Lev. *Giant Hogweed*. Caucasus. Planted in Regents Park, Hyde Park, Kensington Gardens, Buckingham Palace grounds and Ranelagh Gardens, S.W.3. It regenerates freely in all its localities.

DAUCUS CAROTA L. *Carrot*. Rare. Canal side, Paddington.

EUPHORBIACEAE

MERCURIALIS ANNUA L. *Annual Mercury*. A common weed in the parks and squares; frequent on waste ground, and in gardens, Camberwell, Kennington, Lambeth, Walworth, etc.

EUPHORBIA HELIOSCOPIA L. *Sun Spurge*. Kensington Gardens, one plant, 1958, D.E.A. Eaton Square, S.W.1, 1958, D.McC. Imperial War Museum site, Lambeth, common, *Ager*.

E. PEPLUS L. *Petty Spurge*. Common. A persistent garden weed.

E. EXIGUA L. *Dwarf Spurge*. Eaton Square, S.W.1, in plenty‡, D.McC.

POLYGONACEAE

POLYGONUM AVICULARE L. *Knotgrass*. Common on bare waste places and paths.

P. AEQUALE Lindm. *Knotgrass*. Common in similar situations to the previous species.

P. AMPHIBIUM L. *Amphibious Bistort*. Lake in Buckingham Palace grounds; perhaps introduced. Hyde Park, a patch on Crystal Palace site, 1959, D.E.A.

P. PERSICARIA L. *Persicaria*. Common.

P. LAPATHIFOLIUM L. *Pale Persicaria*. Rare. Hyde Park.

P. CONVOLVULUS L. *Black Bindweed*. A common weed in the parks and squares.

† P. BALDSCHUANICUM Regel. *Russian Vine*. W. Asia. Garden outcast. Climbing over hoardings, Park Road, N.W.8.

† P. CUSPIDATUM Sieb. & Zucc. Japan. Garden escape. A common pest in the parks and squares, also on waste ground.

RUMEX ACETOSELLA L. *Sheep's Sorrel*. Kensington Gardens. Buckingham Palace grounds. Primrose Hill.

R. ACETOSA L. *Sorrel*. Regents Park. Hyde Park and Kensington Gardens, D.E.A.

R. CRISPUS L. *Curled Dock*. Common.

R. CRISPUS X OBTUSIFOLIUS = R. X ACUTUS L. Camberwell.

R. OBTUSIFOLIUS L. *Broad-leaved Dock*. Common.

R. SANGUINEUS L. *Red-veined Dock*. Regents Park. Kensington Gardens, D.E.A. Buckingham Palace grounds.

R. CONGLOMERATUS Murr. *Sharp Dock*. Ranelagh Gardens, S.W.3. Regents Park. Battersea Park.

URTICACEAE

PARIETARIA DIFFUSA Mert. & Koch. *Pellitory-of-the-Wall*. On the short stretch of exposed "Roman wall" by St. Alphege Church, E.C., Lousley (1946). Wall of Chelsea Physic Garden, Swan Walk, S.W.3. Wall by railway near Paddington station.

URTICA URENS L. *Small Nettle*. Common in flower-beds and shrubberies in the parks and squares.

URTICA DIOICA L. *Stinging Nettle*. Primrose Hill. Regents Park. Kensington Gardens. Eaton Square, S.W.1[‡], D.McC. St. Thomas's Hospital grounds, Ager.

CANNABIACEAE

HUMULUS LUPULUS L. *Hop*. Very rare. Regents Park, 1941.

† CANNABISSATIVA L. *Hemp*. Asia. Garden weed, Broadway, S.W.1, 1953.

ULMACEAE

ULMUS PROCERA Salisb. *English Elm*. Buckingham Palace grounds.

MORACEAE

† FICUS CARICA L. *Fig*. Mediterranean region. Chester Square, S.W.1, 1947. Canal bank, Gloucester Avenue, N.W.1, 1959. Originating either from bird-sown seed or discarded fruit.

PLATANACEAE

† PLATANUS X HYBRIDA Brot. *London Plane*. A tree commonly planted in London streets, parks and squares. Self-sown seedlings are common.

BETULACEAE

BETULA PENDULA Roth. *Silver Birch*. Frequently planted in the parks. Self-sown seedlings have been noted in Hyde Park.

FAGACEAE

QUERCUS ROBUR L. *Common Oak*. Seedlings have been noted at Hyde Park, Kensington Gardens and Eaton Square, S.W.1.

SALICACEAE

† *POPULUS X CANADENSIS* Moench. *Black Italian Poplar*. N. America. Planted in the parks. A solitary sapling, originating from self-sown seed, was noted growing out of a wall in Kensington Gardens, 1958, D.E.A.†.

SALIX CAPREA L. *Goat Willow*. Kensington Gardens‡, D.E.A.

PRIMULACEAE

ANAGALLIS ARvensis L. *Scarlet Pimpernel*. Buckingham Palace grounds. Hyde Park‡, D.E.A. Regents Park. Eaton Square, S.W.1, 1958. The var. *CARNEA* (Schrink) Druce occurred at Eaton Square, S.W.1, 1958, D.McC.

A. FOEMINA Mill. *Blue Pimpernel*. Regents Park, 1954, H.C.H., *Lousley* (1955).

BUDDLEJACEAE

† *BUDDLEJA DAVIDII* Franch. China. Garden escape. Waste ground, St. John's Wood, in quantity, 1957, H.C.H. Regents Park. Waste ground, Paddington, 1959. Walls near Victoria station, D.McC. Letts Wharf, S.E.1.

OLEACEAE

FRAXINUS EXCELSIOR L. *Ash*. Planted in the parks and squares. Self-sown seedlings have been noted at Paddington, 1948. Eaton Square, S.W.1, 1958, D.McC. Hyde Park‡ and Kensington Gardens‡, 1958, D.E.A. Ranelagh Gardens, S.W.3, 1959. Regents Park.

CONVOLVULACEAE

CONVOLVULUS ARvensis L. *Corn Bindweed*. Common.

CALystegia SEPIUM (L.) R.Br. *Bindweed*. Regents Park. Buckingham Palace grounds. Kensington Gardens and St. James's Park, D.E.A. Lambeth. Elephant and Castle.

† *C. SILVATICA* (Kit.) Griseb. *Larger Bindweed*. S.-E. Europe. Garden escape. Common.

† *C. PULCHRA* Brummitt & Heywood, *C. DAHURICA* auct., non (Herbert) G. Don. Garden escape. Grounds of Natural History Museum, S. Kensington‡, J.B.E. and E.B.B.

SOLANACEAE

† *LYCIUM HALIMIFOLIUM* Mill. *Duke of Argyll's Tea-plant*. S.-E. Europe. Garden escape. Railway side near Paddington, in quantity.

ATROPA BELLA-DONNA L. *Deadly Nightshade*. Very rare. Near Chelsea Hospital, I.W.D., *Lousley* (1945). Garden weed, Campden Hill, W.8, 1946, A.J.W.

HYOSCYAMUS NIGER L. *Henbane*. Garden of St. Mark's College, Chelsea, I.W.D., *Lousley* (1945). Duck Island, St. James's Park, 1955, W.G.T.

† *PHYSALIS ALKEKENGI* L. *Japanese Lantern*. Asia. Garden escape. Grounds of Natural History Museum, S. Kensington, 1953, E.B.B.‡.

*† *LYCOPERSICON ESCULENTUM* Hill. *Tomato*. S. America. Hyde Park and Kensington Gardens‡, D.E.A. Maida Vale, W.9, 1959. Hungerford Bridge, W.C.2, 1959. Seedlings and plants originating from discarded fruit.

SOLANUM DULCAMARA L. *Woody Nightshade*. Common.

S. NIGRUM L. *Black Nightshade*. A common weed in parks, squares and gardens.

*†*S. TUBEROSUM* L. *Potato*. S. America. Outcast from cultivation. Kensington Gardens.

*†*DATURA STRAMONIUM* L. *Thorn-apple*. Asia or America. Creswell Place, S.W.3, 1942, I.W.D., *Lousley* (1945). Near Victoria station, 1951. Cheyne Walk, S.W.3, 1959, L.D.P. Ranelagh Gardens, S.W.3, 1959. St. George's Primary School, Battersea, 1959, *Evening News*, October 2, 1959.

SCROPHULARIACEAE

VERBASCUM THAPSUS L. *Aaron's Rod*. Regents Park, 1955, H.C.H.

† *V. PHLOMOIDES* L. Europe. Garden escape. Hyde Park and Kensington Gardens, D.E.A. and D.McC.

LINARIA VULGARIS Mill. *Toadflax*. Kensington Gardens, 1942. Railway side near Paddington.

VERONICA CHAMAEDRYS L. *Germander Speedwell*. Hyde Park, 1947. Eaton Square, 1956.

† *V. LONGIFOLIA* L. Europe. Garden escape. Regents Park, H.C.H.

V. HEDERIFOLIA L. *Ivy-leaved Speedwell*. Eaton Square, S.W.1, 1958, D.McC.

† *V. PERSICA* Poir. *Buxbaum's Speedwell*. Europe. Hyde Park, D.E.A. Kensington Gardens. Buckingham Palace grounds. Regents Park. Eaton Square, S.W.1.

* *V. AGRESTIS* L. *Field Speedwell*. Kensington Gardens. Hyde Park, D.E.A.

* *EUPHRASIA NEMOROSA* (Pers.) Wallr. *Eyebright*. Ebury Street, S.W.1, 1946; introduced with turf, D.McC.

LABIATAE

MENTHA ARVENSIS L. *Corn Mint*. Very rare. Kensington Gardens‡, D.E.A.

† *M. ARVENSIS* X *SPICATA* = *M. X GENTILIS* L. Outcast from cultivation. Eccleston Square, S.W.1, 1953, D.McC. conf. R.A.G.

† *M. SPICATA* L. *Spear-mint*. Europe. Outcast from cultivation. Kensington Gardens‡, D.E.A. Duke of York's Headquarters, King's Road, S.W.3.

† *M. LONGIFOLIA* (L.) Huds. *Horse-mint*. Europe. Outcast from cultivation. Regents Park, H.C.H.

† *M. LONGIFOLIA* X *ROTUNDIFOLIA* = *M. X NILIACA* var. *ALOPECUROIDES* (Hull) Briq. Outcast from cultivation. Waste ground, Marylebone, 1959.

LYCOPUS EUROPAEUS L. *Gipsy-wort*. Banks of Paddington and Regents Canals from Paddington to Kings Cross and Islington. River walls of Thames, both banks from Battersea Park to the Grosvenor Canal. Battersea Park lake‡, J.E.L. By Serpentine, Kensington Gardens‡ and Hyde Park‡, D.E.A. Buckingham Palace grounds.

† *MELISSA OFFICINALIS* L. *Balm*. Europe. Escape from Cultivation. Primrose Hill.

† *SALVIA VERTICILLATA* L. S. Europe. Imperial War Museum site, Lambeth, *Ager*.

PRUNELLA VULGARIS L. *Self-heal*. Buckingham Palace grounds. Hyde Park and Kensington Gardens, D.E.A.

STACHYS PALUSTRIS L. *Marsh Woundwort*. Canal bank near Paddington and at Regents Park.

S. SYLVATICA L. *Hedge Woundwort*. Regents Park. Kensington Gardens. Eaton Square, S.W.1, 1958. Battersea Park.

BALLOTA NIGRA L. *Black Horehound*. Common.

LAMIUM AMPLEXICAULE L. *Henbit*. Buckingham Palace grounds. Regents Park, J.E.L. Eaton Square, S.W.1, 1958. St. James's Park, 1958; Kensington Gardens, 1959, D.E.A.

L. PURPUREUM L. *Red Dead-nettle*. Common.

L. ALBUM L. *White Dead-nettle*. Common.

GALEOPSIS TETRAHIT L. *Common Hemp-nettle*. Regents Park. St. Thomas's Hospital grounds, S.E.1, one plant, 1946, Ager.

G. BIFIDA Boenn. Hyde Park‡ and Kensington Gardens‡, D.E.A. Grounds of L.C.C. Comprehensive School, Finchley Road, N.W.8, 1959, H.C.H.

*†MARRUBIUM VULGARE L. *White Horehound*. Europe. Primrose Hill, 1949.

SCUTELLARIA GALERICULATA L. *Skull-cap*. Canal bank, Paddington, Marylebone and Islington.

PLANTAGINACEAE

PLANTAGO MAJOR L. *Great Plantain*. Very common.

P. MEDIA L. *Hoary Plantain*. Kensington Gardens, two plants in turf, on west bank of Serpentine, 1959, D.E.A.

P. LANCEOLATA L. *Ribwort*. Common.

† P. MARITIMA L. *Sea Plantain*. Hyde Park, two plants in gravel by the Bowling Green, 1959, D.E.A.

CAMPANULACEAE

* CAMPANULA TRACHELIUM L. *Nettle-leaved Bellflower*. Belgrave Square, S.W.1, 1945. Canal path, Marylebone, 1957.

† C. RAPUNCULOIDES L. *Creeping Bellflower*. Europe. Garden escape. Regents Park, H.C.H.

* C. ROTUNDIFOLIA L. *Harebell*. Lawn in front of University of London building, Malet Street, W.C.1, 1947; presumably introduced with turves.

RUBIACEAE

SHERARDIA ARVENSIS L. *Field Madder*. Eaton Square, S.W.1, 1956.

GALIUM VERUM L. *Lady's Bedstraw*. Rare. Kensington Gardens‡, D.E.A. Kennington.

G. APARINE L. *Goosegrass*. Common.

CAPRIFOLIACEAE

SAMBUCUS NIGRA L. *Elder*. Seedlings, introduced by the agency of birds, are common on waste ground, etc.

DIPSACACEAE

SUCCISA PRATENSIS Moench. *Devil's-bit Scabious*. Tower of London gardens, 1949.

DIPSACUS FULLONUM L. *Teazel*. St. Peter's Churchyard, Eaton Square, S.W.1, D.McC.

COMPOSITAE

BIDENS TRIPARTITA L. *Tripartite Bur-Marigold*. Regents Canal from Marylebone to Kings Cross and Islington. River wall, Battersea Park, 1959.

† GALINSOGA PARVIFLORA Cav. *Gallant Soldier*. S. America. A common weed in the squares and parks, and in gardens.

† G. CILIATA (Raf.) Blake. S. America. Hyde Park‡, Kensington Gardens‡ and St. James's Park, D.E.A. A common weed in Mayfair, Pimlico, Chelsea, Kensington and Marylebone. Abundant by Regents Canal, Islington. Lambeth. Camberwell. Walworth.

SENECIO JACOBAEA L. *Ragwort*. Buckingham Palace grounds. Regents Park, one plant, 1956, H.C.H. Kensington Gardens, one plant, 1958‡, D.E.A. Chelsea Hospital grounds, 1959.

S. ERUCIFOLIUS L. *Hoary Ragwort*. Very rare. Camberwell.

† S. SQUALIDUS L. *Oxford Ragwort*. S. Europe. Abundant on waste ground, along canal paths and railway banks, and on walls.

S. SQUALIDUS X VISCOsus = S. X LONDINENSIS Lousley. Grounds of Natural History Museum, S. Kensington, 1949, E.B.B. Marylebone, 1949.

S. VISCOsus L. *Stinking Groundsel*. Buckingham Palace grounds. Regents Park. Lord's Cricket Ground. Hyde Park. Kensington Gardens, D.E.A. Railway tracks, Paddington, 1959. Railway tracks, Camberwell, 1959.

S. VULGARIS L. *Groundsel*. Very common. The var. HIBERNICUS Syme (var. RADIATUS auct., non Koch) has been recorded from Regents Park, 1947, A.H.G.A.

TUSSILAGO FARFARA L. *Coltsfoot*. Common.

† CALENDULA OFFICINALIS L. *Marigold*. S. Europe. Garden escape. Established in quantity about railway premises, Nine Elms, Battersea, 1959.

GNAPHALIUM SYLVATICUM L. *Wood Cudweed*. Air-raid shelter, Hyde Park, 1945, L.G.P. and J.E.L., Lousley (1946A).

G. ULIGINOSUM L. *Marsh Cudweed*. Buckingham Palace grounds. Railway tracks near Paddington station, 1959.

† SOLIDAGO ALTISSIMA L. *Tall Golden-rod*. N. America. Garden escape. Waste ground, Portland Place, 1955, H.C.H.

† S. GIGANTEA var. LEIOPHYLLA Fern. N. America. Garden escape. Camberwell.

† ASTER NOVAE-ANGLIAE L. *Michaelmas Daisy*. N. America. Garden escape. Grounds of Natural History Museum, S. Kensington‡, E.B.B. Kensington Gardens‡, D.E.A.

† A. LANCEOLATUS Willd. *Michaelmas Daisy*. N. America. Garden escape. Rather common on waste ground, etc.

† A. NOVI-BELGII L. *Michaelmas Daisy*. N. America. Garden escape. Rather common on waste ground, etc.

† CONYZA CANADENSIS (L.) Cronq. *Canadian Fleabane*. N. America. Very common.

BELLIS PERENNIS L. *Daisy*. Common on lawns and turf in the parks and squares.

CHAMAEMELUM NOBILE (L.) All. *Chamomile*. Buckingham Palace grounds; originally planted as a lawn but now established in grass in various parts of the grounds. Kensington Gardens, 1959‡, D.E.A. Lawn, Cremorne Estate, Chelsea, 1959.

ACHILLEA MILLEFOLIUM L. *Yarrow*. Common.

A. PTARMICA L. *Sneezewort*. Very rare. Regents Park.

TRIPLEUROSPERMUM MARITIMUM subsp. INODORUM (L.) Hyland. ex Vaarama. *Scentless Mayweed*. Common.

MATRICARIA RECUTITA L. *Wild Chamomile*. Common.

† M. MATRICARIOIDES (Less.) Porter. *Rayless Mayweed*. N.-E. Asia. Common on bare waste ground.

CHRYSANTHEMUM LEUCANTHEMUM L. *Ox-eye Daisy*. Rare. Buckingham Palace grounds. Kensington Gardens‡, D.E.A. Hyde Park, D.E.A. and D.McC.

† C. PARTHENIUM (L.) Bernh. *Feverfew*. S.-E. Europe. Garden escape. Hyde Park. Kensington Gardens‡, D.E.A. Green Park. Embankment of St. Thomas's Hospital, S.E.1, *Ager*.

ARTEMISIA VULGARIS L. *Mugwort*. Common.

† A. VERLOTORUM Lamotte. China. Common on waste ground near the Thames at Kennington, Lambeth, Battersea and Chelsea. Islington. For an account of this interesting species see *Watsonia*, 1, 209 (1950).

A. ABSINTHIUM L. *Wormwood*. Rare. Chelsea, 1943, W.J.L.S., *Lousley* (1945). Marylebone, 1955, H.C.H.

ARCTIUM MINUS Bernh. *Lesser Burdock*. Common.

CIRSIUM VULGARE (Savi) Ten. *Spear Thistle*. Common.

C. ARVENSE (L.) Scop. *Creeping Thistle*. Very common.

*†CENTAUREA CYANUS L. *Cornflower*. Garden escape. Waste ground, Duke of York's Headquarters, King's Road, S.W.3, 1959.

C. NIGRA L. *Lesser Knapweed*. Regents Park, H.C.H. Kensington Gardens‡ and Hyde Park‡, D.E.A. Eaton Square, S.W.1, 1958, D.McC. St. Thomas's Hospital grounds, S.E.1, rare, *Ager*.

*†C. CALCITRAPA L. *Star Thistle*. Europe. Waste ground Chester Mews, S.W.1, 1951‡, D.McC and J.C.C., *Lousley* (1952).

LAPSANA COMMUNIS L. *Nipplewort*. Common.

HYPOCHOERIS RADICATA L. *Cat's Ear*. Common.

LEONTODON TARAXACOIDES (Vill.) Mérat. *Hairy Hawkbit*. Rare. Primrose Hill, 1959. Eaton Square, S.W.1, 1958, D.McC.

L. AUTUMNALIS L. *Autumnal Hawkbit*. Common.

† TRAGOPOGON PRATENSIS subsp. PRATENSIS. *Goat's-beard*. Europe. Regents Park, 1955, H.C.H.

T. PRATENSIS subsp. MINOR (Mill.) Wahlenb. *Goat's-beard*. Hyde Park. Kensington Gardens, D.E.A. Buckingham Palace grounds. Primrose Hill. Eaton Square, S.W.1, 1958, D.McC. Battersea Park.

LACTUCA SERRIOLA L. *Prickly Lettuce*. Kensington Gardens. 1948. Eaton Square, S.W.1. Camberwell. Kennington.

L. VIROSA L. Very rare. Regents Park.

MYCELIS MURALIS (L.) Dumort. *Wall Lettuce*. Regents Park. Basement near the B.B.C., Portland Place, W.1, a vigorous plant, 1956, H.C.H.

SONCHUS ARVENSIS L. *Field Milk-thistle*. Rather common.

S. OLERACEUS L. *Sow-Thistle*. Very common.

S. ASPER (L.) Hill. *Spiny Sow-Thistle*. Hyde Park, D.E.A. Kensington Gardens. Buckingham Palace grounds. Eaton Square, S.W.1, 1958, D.McC. Oval Cricket Ground, 1959.

† CICERBITA MACROPHYLLA (Willd.) Wallr. Caucasus. Garden escape. Railway side near Paddington station. 1952, R.S.R.F. Regents Park, 1955, H.C.H.

HIERACIUM EXOTERICUM Jord. Kensington Gardens. Grounds of Natural History Museum, S. Kensington‡, E.B.B.

H. LEPIDULUM (Stenstr.) Omang. Kensington Gardens‡, D.E.A., det. C.W. and P.D.S. The var. HAEMATOPHYLLUM Dahlst. was noted in Buckingham Palace grounds, by Constitution Hill, 1956, D.McC.; 1957‡, *Lousley* (1958).

† *H. VAGUM* Jord. Railway banks near Paddington.

† *CREPIS VESICARIA* subsp. *TARAXACIFOLIA* (Thuill.) Thell. *Beaked Hawk's-beard*. Europe. Grounds of Natural History Museum, S. Kensington, J.B.E. and E.B.B. Primrose Hill. St. Thomas's Hospital grounds, S.W.1, Ager. Camberwell. Peckham.

C. CAPILLARIS (L.) Wallr. *Smooth Hawk's-beard*. Regents Park. Hyde Park and Kensington Gardens, D.E.A. Ranelagh Gardens, S.W.3. Lambeth. Camberwell.

TARAXACUM OFFICINALE Weber. *Dandelion*. Common.

T. LAEVIGATUM (Willd.) DC. *Lesser Dandelion*. Kensington Gardens and Hyde Park, D.E.A.

ALISMATACEAE

ALISMA PLANTAGO-AQUATICA L. *Water-Plantain*. Very rare. Canal near Paddington, 1948.

POTAMOGETONACEAE

POTAMOGETON PERFOLIATUS L. *Perfoliate Pondweed*. Regents Canal, Islington.

P. PUSILLUS L. Round Pond, Kensington Gardens. It was first collected here in 1871.

P. CRISPUS L. *Curled Pondweed*. Round Pond, Kensington Gardens, A.H.G.A. Lily Ponds, Kensington Gardens, 1949. Hyde Park, 1949, D.M.E. Regents Canal, Islington, abundant.

P. PECTINATUS L. *Fennel-leaved Pondweed*. Round Pond, Kensington Gardens, 1944. Lily Ponds, Kensington Gardens, 1949. Hyde Park, 1949, D.M.E. Regents Canal, Islington, abundant.

ZANNICHELLIACEAE

ZANNICHELLIA PALUSTRIS L. *Horned Pondweed*. Round Pond, Kensington Gardens, abundant‡, D.E.A. Lily Ponds, Kensington Gardens, 1949.

JUNCACEAE

† *JUNCUS TENUIS* Willd. N. America. St. Peter's Churchyard, Hobart Place, S.W.1, 1954-58‡, D.McC. Kensington Gardens, in several places‡, D.E.A.

J. BUFONIUS L. *Toad Rush*. Hyde Park‡ and Kensington Gardens‡, D.E.A.

J. EFFUSUS L. *Soft Rush*. Kensington Gardens.

LUZULA CAMPESTRIS (L.) DC. *Field Woodrush*. Buckingham Palace grounds. Kensington Gardens. Regents Park, H.C.H.

ARACEAE

† *ACORUS CALAMUS* L. *Sweet Flag*. Orient. Regents Canal near St. Pancras, 1959.

ARUM MACULATUM L. *Cuckoo-pint*. Buckingham Palace grounds.

LEMNACEAE

LEMNA MINOR L. *Duckweed*. Regents Park, 1944.

CYPERACEAE

SCIRPUS MARITIMUS L. *Sea Club-rush*. Edge of lake, Buckingham Palace grounds; perhaps planted,

S. LACUSTRIS L. *Bulrush*. Lake in Buckingham Palace grounds‡, D.M.E.; perhaps planted.

ELEOCHARIS PALUSTRIS (L.) Roem. & Schult. *Common Spike-rush.*
Edge of lake, Buckingham Palace grounds†, D.M.E.

† CYPERUS ROTUNDUS L. *Tiger Nut.* Tropics. Primrose Hill, a small clump, 1959.

CAREX ACUTIFORMIS Ehrh. *Lesser Pond-sedge.* Verge of lake, Buckingham Palace grounds; perhaps planted.

C. HIRTA L. *Hairy Sedge.* Hyde Park. Kensington Gardens, D.E.A. Primrose Hill. Buckingham Palace grounds, D.M.C.C.

C. ACUTA L. *Tufted Sedge.* Verge of lake, Buckingham Palace grounds; perhaps planted.

C. OTRUBAE Podp. *False Fox-sedge.* Canal side near Paddington.

C. SPICATA Huds. *Spiked Sedge.* Rare. Regents Park.

C. MURICATA L. *Prickly Sedge.* Rare. Bird Sanctuary, Hyde Park, 1959, D.E.A. conf. A.C.J.

C. REMOTA L. *Remote Sedge.* Near County Hall, Lambeth, a small clump, 1946, Ager.

C. OVALIS Gooden. *Oval Sedge.* Rare. Kensington Gardens.

GRAMINEAE

PHRAGMITES COMMUNIS Trin. *Reed.* Verge of lake, Buckingham Palace grounds; perhaps planted.

GLYCERIA MAXIMA (Hartm.) Holmberg. *Reed-grass.* Verge of lake, Buckingham Palace grounds; perhaps planted.

FESTUCA PRATENSIS Huds. *Meadow Fescue.* Regents Park. Buckingham Palace grounds. Kensington Gardens†, D.E.A.

F. PRATENSIS X LOLIUM PERENNE = X FESTULOLIUM LOLIACEUM (Huds.) P. Fourn. Regents Park, 1956, H.C.H.

F. ARUNDINACEA Schreb. *Tall Fescue.* Regents Park, H.C.H. Verge of lake, Buckingham Palace grounds: perhaps planted.

F. GIGANTEA (L.) Vill. *Tall Brome.* Rare. Regents Park.

F. RUBRA L. *Creeping Fescue.* Hyde Park and Kensington Gardens, D.E.A.

F. OVINA L. *Sheep's Fescue.* Regents Park, H.C.H. Kensington Gardens, D.E.A.

F. TENUIFOLIA Sibth. Rare. Regents Park, H.C.H.

*†F. LONGIFOLIA Thuill. Europe. Green Park, 1957.

LOLIUM PERENNE L. *Rye Grass.* Common.

† L. MULTIFLORUM Lam. *Italian Rye Grass.* Europe. Common.

*†L. TEMULENTUM L. *Darnel.* S. Europe. Flower-bed weed, Cheyne Walk, S.W.3, 1956, D.M.C.C.

POA ANNUA L. *Annual Poa.* Abundant everywhere.

P. NEMORALIS L. *Wood Poa.* Rare. Kensington Gardens. Hyde Park, B.W. Buckingham Palace grounds. Regents Park, H.C.H.

P. PRATENSIS L. *Meadow-grass.* Common.

P. ANGUSTIFOLIA L. Probably common. Regents Park. Primrose Hill.

P. TRIVIALIS L. Regents Park. Marylebone. Paddington. Kensington Gardens. Buckingham Palace grounds. Lord's Cricket Ground.

*†P. PALUSTRIS L. Europe. Air raid shelter, Hyde Park, 1945, W.J.L.S., Lousley (1945).

DACTYLIS GLOMERATA L. *Cock's-foot.* Very common.

CYNOSURUS CRISTATUS L. *Crested Dog's-tail.* Buckingham Palace grounds. Hyde Park. Kensington Gardens and St. James's Park, D.E.A.

MELICA UNIFLORA Retz. *Wood Melick*. Rare. Regents Park, H.C.H.

BROMUS RAMOSUS Huds. *Hairy Brome*. St. John's Wood, 1956, H.C.H.

B. STERILIS L. *Barren Brome*. Common.

B. MOLLIS L. *Lop-grass*. Hyde Park. Kensington Gardens. Regents Park, H.C.H. Battersea Park. Camberwell.

B. LEPIDUS Holmberg. Rare. Kensington Gardens.

*†B. JAPONICUS Thunb. Europe. Hyde Park, 1945, A.B.

BRACHYPODIUM SYLVATICUM (Huds.) Beauv. *Slender False-brome*. Hyde Park. Kensington Gardens. Regents Park, H.C.H.

AGROPYRON REPENS (L.) Beauv. *Couch-grass*. Common.

*†SECALE CEREALE L. *Rye*. Kensington Gardens, 1947.

HORDEUM SECALINUM Schreb. *Meadow Barley*. Regents Park, H.C.H. Kensington Gardens.

H. MURINUM L. *Wall Barley*. Very common.

*†H. VULGARE L. *Barley*. Green Park, 1952.

*†H. DISTICHON L. *Barley*. Regents Park, H.C.H.

TRISETUM FLAVESCENS (L.) Beauv. *Yellow Oat*. Regents Park, H.C.H. Hyde Park and Kensington Gardens, D.E.A.

† AVENA FATUA L. *Wild Oat*. Europe. Canal path, Paddington, 1948. Regents Park, H.C.H. Canal View, N.W.1, 1959.

*†A. SATIVA L. *Oat*. Kensington Gardens.

ARRHENATHERUM ELATIUS (L.) Beauv. ex J. & C. Presl. *Oat-grass*. Green Park. Kensington Gardens. Regents Park. Paddington.

HOLCUS LANATUS L. *Yorkshire Fog*. Buckingham Palace grounds. Regents Park. Primrose Hill. Hyde Park. Kensington Gardens and St. James's Park, D.E.A.

H. MOLLIS L. *Creeping Soft-grass*. Regents Park†, H.C.H. Kensington Gardens†, D.E.A. Buckingham Palace grounds.

DESCHAMPSIA CESPITOSA (L.) Beauv. *Tufted Hair-grass*. Regents Park. Primrose Hill. Kensington Gardens, one tussock, 1949.

AGROSTIS CANINA L. *Brown Bent-grass*. Very rare. Kensington Gardens, 1948.

A. TENUIS Sibth. *Common Bent-grass*. Common.

A. GIGANTEA Roth. Hyde Park†, B.W. Kensington Gardens. Regents Park†, H.C.H. Eaton Square, 1958, D.McC. Elephant and Castle. Camberwell.

A. STOLONIFERA L. *Fiorin*. Common.

* APERA SPICA-VENTI (L.) Beauv. *Silky Apera*. Primrose Hill, 1949. Eaton Square, S.W.1, 1954, D.McC., Lousley (1955); 1958, D.McC.

PHLEUM BERTOLONII DC. *Cat's-tail*. Regents Park, H.C.H. Kensington Gardens†, and St. James's Park, D.E.A. Hyde Park. Primrose Hill.

P. PRATENSE L. *Timothy*. Hyde Park. Regents Park. Kensington Gardens†, D.E.A. Camberwell, Peckham.

ALOPECURUS MYOSUROIDES Huds. *Black Twitch*. Regents Park, H.C.H. Eaton Square, S.W.1, 1958, D.McC.

A. PRATENSIS L. *Foxtail*. Common.

A. GENICULATUS L. *Marsh Foxtail*. Verge of lake, Buckingham Palace grounds. Kensington Gardens, 1959; introduced with soil, D.E.A.

ANTHOXANTHUM ODORATUM L. *Sweet Vernal-grass*. Regents Park, H.C.H. Buckingham Palace grounds. Hyde Park. Kensington Gardens, D.E.A.

PHALARIS ARUNDINACEA L. *Reed-grass*. Verge of lake, Buckingham Palace grounds†, D.M.E.; perhaps planted.

*†*P. CANARIENSIS* L. *Canary Grass*. N. Africa. Kensington Gardens† and Hyde Park†, D.E.A. Eaton Square, S.W.1, 1958, D.McC. Imported as cage-bird seed.

*†*SETARIA VIRIDIS* (L.) Beauv. *Green Bristle-grass*. Europe. Canal bank near Paddington, 1949. Introduced with cage-bird seed.

*†*S. ITALICA* (L.) Beauv. Europe. Kensington Gardens, 1950. Hanover Square, W.1, one plant, 1959, D.McC. Imported as "millet" sprays for cage-birds.

*†*PANICUM MILIACEUM* L. *Millet*. S. Europe. Regents Park, H.C.H. Hyde Park, 1959, D.E.A. and D.McC. Lett's Wharf, S.E.1, 1959. Imported as cage-bird seed.

PLANT TAXA RECORDED FROM BOMBED SITES IN CENTRAL LONDON, BUT UNREPORTED FROM OTHER HABITATS THERE SINCE 1939

†*Anemone* × *hybrida*, †*Aquilegia vulgaris*, †*Papaver atlanticum*, †*Eschscholzia californica*, *Corydalis claviculata*, †*Brassica oleracea*, †*B. napus*, *B. nigra*, *†*Lepidium sativum*, **Cochlearia officinalis*, †*Bunias orientalis*, *†*Malcolmia maritima*, *†*Lobularia maritima*, *†*Lunaria annua*, *†*Aubrieta deltoidea*, †*Arabis caucasica*, †*Matthiola incana*, †*Cheiranthus cheirii*, *Arabidopsis thaliana*, *†*Descurainia sophia*, **Viola tricolor*, **Silene noctiflora*, †*Agrostemma coronaria*, †*Dianthus barbatus*, †*D. caryophyllus*, †*D. deltoides*, †*Cerastium tomentosum*, *Myosoton aquaticum*, *Stellaria graminea*, *Sagina ciliata*, *†*Amaranthus hybridus*, *Chenopodium hybridum*, †*Beta vulgaris*, †*B. cicla*, †*Salsola pestifer*, †*Althaea rosea*, *†*Linum grandiflorum*, *L. catharticum*, *†*Tropaeolum majus*, *†*Citrus aurantiacum*, †*Lupinus polyphyllus*, †*Genista hispanica*, †*Sarothamnus scoparius*, †*Medicago falcata*, *Melilotus altissima*, *†*Trifolium incarnatum*, *T. campestre*, *Anthyllis vulneraria*, *Lotus tenuis*, †*Colutea arborescens*, *†*Onobrychis viciifolia*, †*Vicia sativa*, *†*V. faba*, †*Lathyrus latifolius*, †*Rubus laciniatus*, *R. cardiophyllus*, †*Fragaria ananassa*, *F. vesca*, †*Prunus domestica*, †*P. armeniaca*, †*P. persica*, *Crataegus oxyacanthoides*, †*Sorbus aucuparia*, †*S. intermedia*, †*Pyrus communis*, †*Asparagus officinalis*, *†*Alstroemeria aurantiaca*, †*Endymion non-scriptus*, *Juncus inflexus*, *J. acutiflorus*, †*Allium cepa*, *Lemna polyrhiza*, *Typha latifolia*, *Scirpus fluviatilis*, *Carex pendula*, **Vulpia bromoides*, **Puccinellia distans*, *Catapodium rigidum*, *Poa compressa*, †*Cynosurus echinatus*, *Bromus erectus*, *B. thominii*, †*B. secalinus*, *Agropyron caninum*, †*Triticum vulgare*, *†*Avena strigosa*, *Aira caryophyllea*, *Calamagrostis epigejos*, *†*Phalaris paradoxa*, *†*Setaria verticillata*.

REFERENCES

AGER, J. A. M., 1949, Flora of St. Thomas's Hospital and bombed sites. *St. Thomas's Hospital Gazette*, 47.

COOPER, D., 1836-37, *Flora Metropolitana, or botanical rambles within thirty miles of London*. London, 1836. *Supplement*, 1837.

CRESPIGNY, E. C. de, 1877, *A New London Flora; or handbook to the botanical localities of the Metropolitan districts*. London.

CURTIS, W., 1775-98, *Flora Londinensis; or plates and descriptions of such plants as grow wild in the environs of London*. 6 fasc. London.

DANDY, J. E., 1958, *List of British Vascular Plants*. London.

DYER, W. T. T., 1871, Plants of the site of the Exhibition of 1862. *J. Bot.*, 9, 113-114.

—, 1872, Plants found on the site of the Exhibition of 1862, South Kensington, in *A Key to the London International Exhibition*, 17 June, 1872.

FITTER, R. S. R., and LOUSLEY, J. E., 1953, *The Natural History of the City*. London.

IRVINE, A., 1838, *The London Flora*. London.

JOHNSON, W., 1910, *Battersea Park as a centre for nature study*. London.

JONES, A. W., 1958, The flora of City of London bombed sites. *Lond. Nat.*, 37, 189-210.

KENT, D. H., 1950, Notes on the flora of Kensington Gardens and Hyde Park. *Watsonia*, 1, 296-300.
— and LOUSLEY, J. E., 1951-57, *A Hand List of the plants of the London Area*, supplement to *Lond. Nat.*, 30-36.
LOUSLEY, J. E., 1944, The pioneer flora of bombed sites in Central London. *Rep. Bot. Soc. & E.C.*, 12, 528-531.
—, 1945, Botanical records for 1943-44. *Lond. Nat.*, 24, 9-13.
—, 1946, The flora of bombed sites in the City of London in 1944. *Rep. Bot. Soc. & E.C.*, 12, 875-883.
—, 1946A, Botanical records for 1945. *Lond. Nat.*, 25, 13-15.
—, 1948, Botanical records for 1947. *Lond. Nat.*, 27, 38-42.
—, 1952, Botanical records for 1951. *Lond. Nat.*, 31, 10-13.
—, 1953, Wild flowers, in Fitter and Lousley, 8-19 and 30-35.
—, 1955, Botanical records for 1954. *Lond. Nat.*, 34, 2-6.
—, 1956, Botanical records for 1955. *Lond. Nat.*, 35, 2-6.
—, 1958, Botanical records for 1957. *Lond. Nat.*, 37, 181-185.
SHENSTONE, J. C., 1910, A wild flower garden in the City of London. *Selborne Mag.*, 21, 191-193.
—, 1912, The flora of London building sites. *J. Bot.*, 50, 117-124.
SHOVE, R. F., 1945, The flora of a derelict site in the Zoological Gardens, Regents Park. *School Nat. Study*, 40, 58-60.
WARREN, J. B. L., 1871, The flora of Hyde Park and Kensington Gardens. *J. Bot.*, 9, 227-238.
—, 1875, Further notes on the plants found on the site of the Exhibition of 1862. *J. Bot.*, 13, 276.
—, 1875A, Kensington Gardens plants. *J. Bot.*, 13, 336.
WEBSTER, A. D., 1911, *The Regents Park and Primrose Hill History and Antiquities*. London.
WRIGHTON, F. E., 1950, Plant ecology at Cripplegate, 1949. *Lond. Nat.*, 29, 85-88.

The Survey of Bookham Common

EIGHTEENTH YEAR

Progress Report

1959 will, it is hoped, prove to be one of the most fruitful years in the history of the management of Bookham Common. During the discussion following a talk to the Society in February on Nature Reserves by Miss J. M. Laptain of the Nature Conservancy, advice was sought on the serious problem of the recent rapid spread of scrub vegetation over the grassland of Bookham Common. After preliminary talks during the summer, with Dr. P. A. Gay, Regional Officer for South-East England, it was with much satisfaction that, in the autumn, Mr. C. P. Castell accepted an invitation to join a party which visited the common in the afternoon of 18 November. The party comprised: from the Nature Conservancy, The Director General (Mr. E. M. Nicholson), Dr. P. A. Gay and Dr. J. F. D. Frazer (Conservation Officer for England); Mr. I. E. Hills representing the National Trust as their S.E. Area Agent and Mr. L. R. Hutchison as the Chairman of their Bookham Commons Committee; Brig. E. F. G. Armstrong, Organizer of the Council for Nature's Conservation Corps; Mr. D. Macer-Wright, former Secretary of the Bookham Commons Committee and Mr. C. P. Castell.

Members of the Bookham Common Survey team had previously drawn up suggestions for management, from the point of view of the naturalist, and these were considered on the spot. Mr. Nicholson explained that the spread of scrub on formerly-grazed common land had become a national problem. As a result of the Society's long-term survey, he regarded Bookham Common as one of the most thoroughly documented areas in the country. He thought it, therefore, most suitable for a pilot scheme of experimental and controlled scrub clearance, with the aid of the Conservation Corps; the lessons learnt could be later applied to commons in other parts of the country. His suggestion met with general approval and Brig. Armstrong agreed to arrange for the Conservation Corps to try to clear about 5 acres of Central Plain early in 1960 and to finish work by early March so as to avoid undue interference with nesting birds. A few larger shrubs and trees would be left. It was intended to continue the work later in the year. Initially, trees and shrubs would be cut to ground level and would require periodical cutting, but other methods would be used later. The small areas already being studied intensively by the Society would be left untouched and would serve as controls. The Conservancy hoped that the Society's survey team would study and report on the results of the clearance.

This scheme offers an incentive to members to take part in work which, if carefully carried out, could be not only of great interest but of national importance.

One immediate result of showing the party the badly overgrown lunch-place of the survey team by the Isle of Wight Pond was, thanks to Mr. Hutchison, its clearance within a week or two. Matters such as the wholesale unauthorized dumping of rubbish in the old gun-pits of Eastern Plain and elsewhere and the severe pollution of Central Ditch by oil discharged by the local factory, were pointed out to the National Trust representatives.

The income of the local National Trust Committee, to which the Society has subscribed for many years, is pitifully small and quite insufficient to employ a warden or keeper, essential to any management scheme.

It is the intention of the Nature Conservancy to schedule Bookham Common as a Site of Special Scientific Interest and it is to be hoped that the Local Authorities and the Surrey County Council, if not the local residents, will take a little more practical interest in the maintenance of the Common, both for its natural history interest and for its amenity value.

The Conservation Corps carried out their work as planned, in parties of about twenty, in six week-end visits from December to March. On two of the visits, Dr. Beven and Mr. Castell talked to the parties about the spread of scrub and some of the survey work done by the Society. Mr. E. M. Nicholson and Dr. P. A. Gay also paid visits to inspect progress.

C.P.C.

VEGETATION (Report by C. P. Castell)

Little intensive work was done, but notes were made on deturfed areas and on Sheepbell and Lower Eastern Ponds; towards the end of the year, the scrub census of 1955 was repeated (see below). Mr. A. W. Jones has brought together and summarized his observations made between 1952 and 1956 on the vegetation of ponds, streams and disturbed ground on p. 76.

A FURTHER NOTE ON THE INCREASE OF SCRUB VEGETATION

In the winter of 1955, a census was made of the scrub invading four acres of *Deschampsia cespitosa*, *Arrhenatherum* grassland in Central Plain (*Lond. Nat.*, 35, 9-10); this was repeated in the winter of 1959 by Miss M. E. Kennedy and Messrs. C. P. Castell, A. W. Jones and G. F. Lawrence, using the same methods. Individual plants of each species were counted and a note made of any over eight feet in height. Clumps of Bramble up to ten feet in diameter were counted as single plants and larger clumps were split up into units of about that size. The number of plants (those over eight feet high in brackets) are tabulated below.

		1951	1955	1959
Hawthorn (<i>Crataegus</i>) ..		93 (15)	415 (66)	609 (205)
Rose (<i>Rosa</i>) ..	..	60	217 (15)	271 (116)
Bramble (<i>Rubus</i>) ..		25 (5 large)	164 (1)	165 (19)
Blackthorn (<i>Prunus</i>) ..		1, 30 x 25 ft.	52 (1)	34 (1)
Ash (<i>Fraxinus</i>) ..	..	2	12 (11)	19 (16)
Oak (<i>Quercus</i>) ..	..	1	7 (1)	14 (6)

(The 1951 and 1955 figures for Bramble and Blackthorn are not comparable.)

It will be seen that Hawthorn, Rose and Bramble are still the main constituents of the invading scrub and that Hawthorn has greatly increased its lead both in numbers and in height. Oak and Ash continue to spread and grow in height. The following were represented by one or two plants only: Crab Apple, Elder, Maple, Willow and Red Currant.

MOLLUSCA

Mr. D. Heppell has sent in some lists of mollusca observed in the late autumn; several species appear to be new to the common.

FLIES

Mr. L. Parmenter contributes on p. 66 a paper on the Diptera observed since his account of them in 1950.

BIRDS (Report by G. Beven).

Mr. W. D. Melluish and his team have continued the bird census of Western and Isle of Wight Plains and a report on this work appears on p. 89. The feeding niches of the birds of these plains are also being studied. There are not yet sufficient observations for detailed analysis, but it has already become evident that the dense cover of tall herbage, particularly long grass, largely prevents many birds from feeding on the ground. This feeding site becomes available to them when the grass is short, as on footpaths or where the ground is nearly bare, as under dense scrub, especially hawthorn. The birds' feeding habits may change rapidly, however, when the ground becomes accessible. On 13 September, 1959, it was found that a small part of Central Plain had been burnt during the previous month. The ground was charred and black, but the stumps of the grass *Deschampsia cespitosa* and some other plants were only singed. All the leaves on the shrubs were scorched brown. It was soon clear that the ground had become a very attractive feeding site for ten or more species and that birds such as Robins and Hedge Sparrows found food there very easily. G. R. Conway collected objects which were clearly visible on the charred ground and these included many unburnt seeds of herbs and also some living insects such as yellow ants, besides dead insects and molluscs.

In the autumn of 1958 there was an unusually good crop of hawthorn and rose fruit, and large numbers of these berries remained even in March and April, 1959. Many Redwings and Fieldfares were eating this fruit in December and January, and to a lesser extent, in February. The berries also formed a large part of the diet of a flock of about 20 Waxwings (*Bombycilla garrulus*), which frequented the Common for several weeks. The Waxwing is not mentioned in the check-list of birds for the Common (Carrington, L. I., Castell, C. P., and Wilton, A. R., 1944, *L.N.* for 1943, pp. 23-29).

Another census of the birds of Eastern Wood was made in the Spring of 1959.

MAMMALS (Report by G. Beven)

During 1958 and 1959, Mr. J. Lord has been trapping small mammals in different habitats at Bookham Common and his results not only emphasize the habitat specializations of various species, but also indicate seasonal and annual fluctuations in population. Water Shrews, *Neomys fodiens*, and Harvest Mice, *Micromys minutus*, were captured during 1958. It is hoped that a report on these interesting findings will be published in due course.

A Further List of the Diptera of Bookham Common

By L. PARMENTER, F.R.E.S.

In 1950, after three and a half years of almost monthly visits to Bookham Common, a preliminary list of the Diptera found there was published in *London Naturalist* for 1949 (Parmenter, 1950). Over 700 species were recorded, with some details of their habitats and habits. The report included an account of the flies visiting 65 species of flowers. Twenty-one members of the Society and friends had helped by reporting habits or collecting specimens.

The publication brought increased interest in the Common, and with other entomological reports on the area attracted entomologists from London, Oxford and Cambridge Universities and members of the staff of the British Museum (Nat. Hist.). Now ten years have passed and another report on the further data collected is due. Although my own attendance has had to be reduced considerably, others have helped to add to our knowledge of the dipterous fauna of the area. If every entomologist visiting the Common had made a complete and efficient report for each of his visits and the work at the Common could have been organized, the results would no doubt have been outstanding. But most visitors had many other interests and few made reports. Time spent on the Common was not confined to collecting or studying Diptera, for the sociability of the entomologists and other naturalists must always be catered for and encouraged. The presence and assistance of specialists other than dipterists has been of great help. There are so many viewpoints, so many different approaches to the study of plants and animals, and so many techniques, that the several hundred naturalists who have visited Bookham Common learn from, and teach each other at every visit.

We are indebted to the following who have helped to collect and study the habits of Diptera on the Common during the past ten years:—

Dr. C. H. Andrewes	W. J. Finnegan	D. Leston
Capt. D. B. Baker	E. C. M. d'A. Fonseca	G. H. Locket
E. B. Bangerter	L. T. Ford	G. Messervy-Whiting
E. B. Basden	C. Garrett-Jones	M. Niblett
Lt. Col. C. J. F. Bensley	G. C. D. Griffiths	G. E. J. Nixon
Dr. G. Beven	E. W. Groves	A. H. Norkett
K. H. Bobe	D. G. Hall	Dr. E. R. Nye
J. Boorman	Mrs. J. F. Hall	D. Ollevant
H. J. Burkhill	P. C. Hall	D. F. Owen
J. F. Burton	C. O. Hammond	A. L. Panchen
B. L. J. Byerley	Dr. E. M. Hering	T. H. Pennington
C. P. Castell	R. H. R. Hill	G. H. Rothschild
S. H. Chalke	Miss E. M. Hillman	F. Rumsey
R. L. Coe	A. W. Jones	W. Rutledge
J. E. Collin	Miss M. E. Kennedy	P. Skidmore
G. B. Collins	I. Lansbury	K. A. Spencer
C. N. Colyer	Dr. B. R. Laurence	W. H. Spreadbury
G. R. Conway	G. F. Lawrence	R. W. J. Uffen
P. W. E. Currie	G. S. Lawrence	R. Underwood
E. R. Denyer	A. le Gros	S. Wakely
Dr. A. M. Easton	P. le Masurier	A. S. Wheeler

SOME RESULTS

The major papers referring to Bookham Diptera are listed at the end of this paper, with other papers referred to in the text. M. Niblett's work on the gall midges, Cecidomyiidae, added 71 species to the 1950 list; they are not repeated in this list. With the additions listed below, the total, by the end of 1959, had become 1,026. This number, although far from final, includes 30 Agromyzidae alone that have been added to the British List since Kloet and Hincks' List of 1945 appeared. It includes species new to science, one of them, *Melanagromyza nibletti* named by our member K. A. Spencer in well-earned recognition of Mr. Niblett's life-long work in rearing flies and discovering their life histories.

The total of 1,026 species can be compared with the lists of the other Orders of insects found at Bookham that have been published:—

Odonata 16	Coleoptera 617	Heteroptera 145
Cynipidae 58	Macro-Lepidoptera 274	

Many flies have been reared, often for the first time, and further data have been collected on the habits of the species found on the Common. The list of flowers visited by Diptera has risen from 65 to 118 out of the 498 species (including the grasses) listed by A. W. Jones (1954). It is proposed to make a separate report on these in a later number of the *London Naturalist*.

In addition, there has been a steadily increased appreciation of the rôle played by flies in the life of the fauna and flora inhabiting Bookham Common. For example, intensive study of gall-makers and leaf-miners, and of the flower-visitors, has drawn the attention of many naturalists to the impact of Diptera on the plants of the Common.

PREDATION ON DIPTERA

As to the birds, the Woodcock has been added to the list in *London Naturalist* for 1943 when L. I. Carrington, C. P. Castell and A. R. Wilton (1944) recorded 80 species for the Common. Of these, 62 species have been listed as feeding on Diptera in Britain by F. C. R. Jourdain (Witherby, *et al.*, 1938). In addition, we have noted Great Tits taking larvae of Trypetidae, Garden Warbler feeding on adult St. Mark's fly (*Bibio marci*) and feel confident that Chaffinch, Reed Bunting, Marsh Tit, Long-tailed Tit, Hedge Sparrow and Red-legged Partridge must include Diptera in their insect diet. The interest to the dipterist is the species or at least the family attacked by the various birds. The Tipulidae, including their larvae the leatherjackets, have many large species easily identified as Crane-flies in the field by ornithologists. These flies are recorded as being eaten in Britain by Jackdaw, Starling, Tree Pipit, Meadow Pipit, Spotted Flycatcher, Sedge Warbler, Mistle Thrush, Song Thrush, Redwing, Blackbird, Wheatear, Whinchat, Robin, Wren, Swallow, Swift, Nightjar, Green Woodpecker, Cuckoo, Little Owl, Common Snipe, Woodcock, Lapwing, Pheasant and Partridge. Bibionidae, including the large St. Mark's fly (*Bibio marci*) have been taken by Pied Wagtail, Blackcap, Whitethroat, Song Thrush, Robin, Swallow, Swift, Heron, Woodcock and Pheasant. Of the other Diptera recorded as the food of birds that are found at Bookham Common are:—

<i>Culicidae</i>	Sand Martin.
<i>Chironomidae</i>	Chiffchaff, Willow Warbler, Wood Warbler, Sedge Warbler, Martin, Heron.
<i>Ceratopogonidae</i>	Heron.
<i>Cecidomyiidae</i>	Stock Dove, Partridge.

<i>Tabanidae</i>	Common Snipe, Woodcock.
<i>Empididae</i>	Sedge Warbler, Heron.
<i>Dolichopodidae</i>	Sedge Warbler (taking <i>Dolichopus ungulatus</i>).
<i>Syrphidae</i>	Meadow Pipit (taking <i>Eristalis</i> sp.).
	Pied Wagtail.
	Stonechat (taking <i>Volucella</i> sp.).
	Cuckoo.
	Common Snipe (taking <i>Eristalis</i> sp.).
	Lapwing (taking <i>Eristalis</i> sp.).
<i>Sphaeroceridae</i>	Robin (taking <i>Trichiaspis [Borborus]</i> sp.).
	Green Woodpecker (taking <i>Trichiaspis [Borborus]</i> <i>equina</i> Fln.).
<i>Chloropidae</i>	Partridge.
<i>Tachinidae</i>	Partridge.
<i>Calliphoridae</i>	Meadow Pipit (taking <i>Calliphora</i> sp.).
	Spotted Flycatcher (<i>Lucilia</i> sp.).
<i>Muscidae</i>	Pied Wagtail, Whitethroat, Song Thrush, Wheatear, Robin, Lapwing, Partridge.

There is a great difficulty in identifying the exact specific food taken by birds, as flies are easily digested. Only a few species can be determined in the field and be observed through field gasses even by watchers in hides close to nests of birds. P. M. Miles has found the examination of bird pellets useful and has listed 27 species of British birds as feeding on Diptera. But the most reliable and productive method appears to be the examination of the food of nestlings by the techniques such as those used by D. F. Owen (1956). Thus from material collected by Owen from nestling Jays in Britain, I have been able to identify *Empis tessellata*, *Helophilus pendulus*, *Syrphidae*, *Calliphoridae* and *Tipulidae* and from nestling Magpies *Empis tessellata*, *Otites guttata* and *Nephrotoma maculata*, *Sarcophaga* sp. and *Tipulidae*. From nestling Swifts Prof. L. W. Grensted and I have identified 38 families of Diptera including 147 species that were identifiable. True, many of these species have not been found at Bookham but the impact of feeding Swifts on the flies of the Common can be realized. Swallows have similarly been studied and the families attacked are *Tipulidae*, *Chironomidae*, *Bibionidae*, *Stratiomyidae*, *Rhagionidae*, *Tabanidae*, *Empididae*, *Dolichopodidae*, *Syrphidae*, *Sphaeroceridae*, *Sepsidae*, *Opomyzidae*, *Cordyluridae*, *Tachinidae* and *Muscidae*.

How widespread must be the potential effect of birds as predators on the flies at Bookham! Its accurate study, however, on a public common by naturalists with very restricted available time cannot be expected to be undertaken. Only the odd record is likely to be forthcoming.

There remain a host of other creatures inhabiting the Common, including the Diptera themselves, that take flies as food. Mammals, amphibians, dragonflies, beetles, especially their larvae, wasps, bugs, spiders, etc., all take toll. In the case of spiders and insects, it is often possible to secure both captor and prey before much damage to the victim has been caused. Such collecting is to be encouraged and can be undertaken by beginners. There is a need for students able and willing to identify both flies and another order of insects or able to work on predation with a student of another group of predatory animals. These tasks are important preliminaries in the appreciation of the interdependence between species, and can be tackled by naturalists relatively untrained, who are willing to learn as they collect and study.

SOME SUGGESTED STUDIES

In the 1950 report, several further studies were suggested. Most of these have still to be attempted and many more can be made. It would have been useful to have the variety of major changes on the Common recorded annually in the Bookham Common Survey report. Such happenings as fires, clearance work, changes in grazing by rabbits and cows, alterations in the water levels of the ponds, all need to be considered for their effect on the animals we study. A weather summary would also have been useful to correlate with the changes in numbers of insect emergences. The major habitats of oak woodland, grass heath, scrub, ponds and marsh need to be compared in relation to the fauna present and the conditions controlling the presence of these inhabitants. Already Elton's estimate of 200 species of animals per major habitat can be shown to be an underestimate in the Diptera alone.

Several families of Diptera have not been studied as well as others. Only the gall causers among the Cecidomyiidae have been listed, and the Chironomidae have hardly been collected at all. A student specializing on a family could not only expect to add to the recorded list, but also to make important contributions to the knowledge of the habits of the species.

The study of flies includes that of their four stages: egg, larva, pupa and adult. The requirements of each stage for most species are still unknown but progress has been made, especially by Messrs. Niblett, Griffiths and Spencer while specializing on a few families of Diptera at Bookham Common.

There is a great ignorance of the parasites of Diptera, which could be remedied by the rearing of quantities of flies of a variety of species and in co-operation with the Hymenoptera specialists who are now increasing in number in this country, in their attack on the problems of identifying and classifying the Parasitica.

Unlike plants and birds, already carefully listed for Bookham, the insect lists are incomplete. The absence of a name does not necessarily indicate that the species is absent. The reasons are several. Not enough students is a major cause. But other factors can be cited. For example, on one August day not a single specimen of any of the common species of *Eristalis* could be seen until 3 p.m. B.S.T. in the afternoon, when the sun came out. Thus a morning visitor would have recorded an absence of this genus. The time of day is relevant for certain Diptera are crepuscular. The restricted habitat may cause species to be overlooked. For instance, a species of Ulidiidae that was found breeding in large numbers by P. W. E. Currie only five yards over the boundary of the Common has never been seen on the Common itself. Some species have only been found in grass tufts, others only in the nests of wasps. There is, therefore, a great need for a large number of dipterists willing and able to study the great variety of micro-habitats. Not only do we want to know that the species is present, but its numbers, life history, habits and requirements of all four stages should be studied.

The flies must be considered as parts of a complicated machine. Their function seems to be to convert the results of the absorption of chemicals from the soil and energy from the sun by plants into other chemical stores and further energy. They form links in the chain between plants and birds and other animals, ever changing through the year and even during the twenty-four hours of the day. As the sun comes out there is a

change in the tempo, a rise in output. Increasing light or warmth, or both, causes the flies to become more active, to require more fuel in the form of nectar, pollen, etc. Pollination is increased with the chain effect of the production of more seeds and a resultant spread of plants.

The sighting of a species of insect on the Common is not just a tick on a tally list, a "new" record for a diligent dipterist, but a new potential factor to be considered that may affect plants and animals of the Common. It is a new challenge to the entomologist to learn the insect's life history and its niche in the environment. Who can doubt, therefore, the need for more entomologists to tackle these problems, to discover new facts and to take the place of the "old timers" who have passed on after leaving a record, admittedly often scattered through several journals, to act as stepping stones on the way for the new explorers and scientists? The facts gathered at Bookham achieve a higher significance on being recorded. They can then be related to the studies of the large number of naturalists that have already been made, and will be made, at this now classic entomological collecting-ground, the one-time haunt of S. R. Ashby, E. B. Bishop, K. G. Blair, E. A. Cockayne, S. Edwards, W. J. Lucas, A. Sich, E. Step, A. E. Tonge, H. J. Turner and W. West.

NOMENCLATURE

There have been several systematic papers on British Diptera during the last decade. The result has been to revise the names used for many families of Diptera and to add many species to the "British List." It is not proposed to amend the names published in our 1950 paper but merely to refer to species under the names now current. The nomenclature of the *Check List* of G. S. Kloet and W. D. Hincks, 1945, is followed except in the following families:—

<i>Pipunculidae</i>	A manuscript list of R. L. Coe.
<i>Syrphidae</i>	Parmenter, L. 1954. A list of the species of Syrphidae (Diptera) of the British Isles. <i>Ent. Gazette</i> , 5 : 135-144.
<i>Trypetidae</i>	Collin, J. E. 1947. The British genera of Trypetidae (Diptera), with notes on a few species. <i>Supp. Ent. Record</i> , 59 : 1-14.
<i>Lonchaeidae</i>	Collin, J. E. 1953. A Revision of the British (and notes on other) Species of Lonchaeidae (Diptera). <i>Trans. Soc. Brit. Ent.</i> , 11 : 181-207.
<i>Sapromyzidae</i>	Collin, J. E. 1948. A short synopsis of the British Sapromyzidae (Diptera). <i>Trans. R. ent. Soc. Lond.</i> , 99 : 225-242.
<i>Drosophilidae</i>	Basden, E. B. 1954. The Distribution and Biology of Drosophilidae (Diptera) in Scotland, including a New Species of <i>Drosophila</i> . <i>Trans. Roy. Soc. Edin.</i> , 62 : 603-654.
<i>Agromyzidae.</i>	Spencer, K. A. 1956. The British Agromyzidae (Dipt.). <i>Proc. S. L. ent. nat. Hist. Soc.</i> , 1954-5 : 98-108.
<i>Chloropidae</i>	Collin, J. E. 1946. The British genera and species of Oscinellinae (Diptera, Chloropidae). <i>Trans. R. ent. Soc. Lond.</i> , 97 : 117-148.
<i>Tachinidae and Calliphoridae</i>	van Emden, F. I. 1954. <i>Handbooks for the Identification of British Insects</i> , 10 , part 4 (a).
<i>Muscidae</i>	Various papers by J. E. Collin and E. C. M. d'A. Fonseca.

SYSTEMATIC LIST

Additional to the list in *London Naturalist* for 1949.

ORTHORRHAPHA—NEMATOCERA

TIPULIDAE

Tipula pagana Mg. Oct., Nov. collected by the late H. J. Burkill and L.P. on Bayfield Plain.
Ula sylvatica (Mg.) reared from the fungus *Russula nigricans* (Bull.) Fr. emerging in Nov. and Dec. (L.P.) also reared by M. Niblett. emergences in Oct.

ANISOPODIDAE

Anisopus zetterstedti Edw. reared in early Oct. from the roots of *Angelica sylvestris* L. by R. W. J. Uffen.

CULICIDAE

Aedes rusticus (Rossi) larvae abundant in the Isle of Wight pond in Dec., 1951. Adults found at Isle of Wight and South Eastern ponds and Western Hollow in May, June and Aug.

CHIRONOMIDAE

[*Cricotopus brevipalpis* Mg.] Dr. E. M. Hering of Berlin has examined leaf-mines found in the pondweed, *Potamogeton natans* L. by L.P. He considers that they are the work of the larvae of this species but the adult has not yet been recorded in this country. It is known from Belgium and Germany.

Hydrobaenus (Smittia) aterrimus (Mg.) swarming in the lee of bushes on Central and Eastern plains in Jan.

H. (Diplocladius) cultriger (Kieffer) swarming in the scrub of Central plain and about the edge of Upper Eastern pond in March.

H. (Orthocladius) ictericus (Mg.) taken on 30 April. 1940.

H. (O.) thienemanni (Kieffer) captured on 25 May, 1941.

All the specimens of *Hydrobaenus* were identified for me by our member Dr. B. R. Laurence.

CERATOPOGONIDAE

Forcipomyia radicola Edw. reared 20 April, 1950, from the stems of *Angelica sylvestris* L.

SIMULIDAE

Simulium (Simulium) equinum (L.) May. females attacking people in Eastern wood and about Lower and Upper Eastern ponds and the Isle of Wight pond.

S. (S.) erythrocephalum (Deg.) April, May, June. near a cart track pool in Central wood, Hill House wood, Greendell Ditch and W. Ruttledge reported that they swarmed about him but did not attack.

S. (Eusimulium) subexcisum Edw. April. at Eastern Hollow, Isle of Wight pond and seen ovipositing over Bookham stream.

S. (S.) venustum Say May, Western Hollow and in a clearing in Central wood.

MYCETOPHILIDAE

Sciara (Bradysia) carbonaria Mg. May. visiting flowers of hawthorn. *Crataegus monogyna* Jacq., Western plain.

Tetragoneura sylvatica (Curt.) May. in South Eastern wood.

ORTHORRHAPHA—BRACHYCERA

EMPIDIDAE

Bicellaria nigra (Mg.) July. Central plain.

B. spuria (Fln.) June, July, Oct., on bracken and leaves of oak trees. Bayfield. Central and Eastern plains, Eastern wood and Manor House marsh.

Drapetis (Crossopalpus) aterrima (Curtis) a female taken on 12 June, 1950.

D. (D.) exilis Mg. a male taken on 6 May, 1951.

D. (C.) nigritella (Zett.) a male taken on 2 April, 1950.

D. (D.) pusilla (Lw.) July. Bayfield plain and by Lower Eastern pond. (Determined by J. E. Collin.)

Empis (Xanthempis) punctata Mg. a female taken on 10 June, 1951.

E. (E.) rufiventris Mg. May, visiting flowers of Great Stitchwort, *Stellaria holostea* L.

Hilara biseta Collin a female at Lower Eastern pond on 11 July, 1948 (determined by E. C. M. d'Assis Fonseca).

H. thoracica Macq. a female found on 11 June, 1950. in Stents wood as the prey of the spider *Dictyna uncinata* Westr. (determined by our member G. H. Locket).

Microphorus anomalus (Mg.) females taken on 12 June, 1949. and 11 June, 1950.

Trichina clavipes Mg. female taken on 12 August, 1951.

T. flavipes Mg. Oct., Central plain on the leaves of *Salix* sp.

DOLICHOPODIDAE

Achalcus cinereus (Walker) May, at Manor pond.

Chrysotus angulicornis Kowarz a male taken on 12 Aug., 1951

C. cilipes Mg. March, in Central wood.

Medeterus saxatilis Collin July. on Bayfield plain.

Porphyrops elegantula Mg. a female taken on 12 June, 1941.

Sciopus longulus (Fln.) June, on Central plain.

PHORIDAE

C. N. Colyer has kindly determined all my specimens of this family.

Gymnophora arcuata (Mg.) collected on 11 July, 1954. Incorrectly mentioned in the 1950 paper p. 115 as *G. acuta* Mg.

Megaselia aequalis (Wood) July. Bayfield plain.

M. emarginata (Wood) June, Bayfield plain.

M. flavicans Schmitz Nov., Hill House wood.

M. gregaria (Wood) June. near the Isle of Wight pond.

M. luteipes Schmitz Nov., at edge of Isle of Wight pond.
M. manicata (Wood) April, at margin of Isle of Wight pond.
M. pleuralis (Wood) July, Oct., Eastern Hollow and Eastern wood.
M. ruficornis (Mg.) June, near the Isle of Wight pond.
M. sinuata Schmitz Nov., Hill House wood.
M. sulphuripes (Mg.) March, found in tufts of grass, Eastern plain.
M. variana Schmitz June, in Central wood.
M. verna Schmitz July, Bayfield plain.
Phora aterrina (F.) June, Bayfield plain.
Triphleba collini Schmitz March, in grass tufts, Bayfield plain.
T. intempsa (Schmitz) Dec., Eastern plain.
T. papillata (Wingate) March, Central wood, Hollow wood.

CYCLORRHAPHA—ASCHIZA

PIPUNCULIDAE

R. L. Coe of the British Museum (Nat. Hist.) has kindly examined all my specimens of this family.
Pipunculus campestris Latr. May, June, in Kelseys wood and Western Hollow.
P. flavipes Mg. June, near the Isle of Wight pond.
P. furcatus Egg. June, Kelseys wood.
P. ultimus Beck. July, Stents Wood west.
P. vittipes Zett. May, Hill House wood.
Verrallia villosa (v. Ros.) May, Hill House wood.

PLATYPEZIDAE

Platypeza infumata Harr. larvae found in the fungus *Polystichus versicolor* (L.) Fr. on 10 Dec., 1950, in Hollow wood. Flies emerged on 25 March to 22 April, 1951.

SYRPHIDAE

Brachypalpus bimaculatus (Macq.) a female taken by P. W. E. Currie at the edge of Kelseys wood on 24 May, 1953.
Cheilosia intonsa Lw. Aug., Central wood.
C. paganus Mg. April, May, Sept., visiting flowers of Lesser Celandine, *Ranunculus ficaria* L. and of Burnet Saxifrage, *Pimpinella saxifraga* L., Central plain.
Helophilus lineatus (F.) 15 Aug. 1953—see report of field meeting *Proc. S. London Ent. Nat. Hist. Soc.*, 1953-54: 89.
Neoascia aenea (Mg.) Aug., at edge of Isle of Wight pond.
Pipiza austriaca Mg. June, visiting flowers of hawthorn, *Crataegus monogyna* Jacq., Central plain.
P. bimaculata Mg. May, on leaves of hazel, *Corylus avellana* L., Hill House wood.
P. fenestrata Mg. May, visiting flowers of Creeping Buttercup, *Ranunculus repens* L., Bayfield plain.
P. luteitarsis Zett. May, in Station Copse.
Syrphus punctulatus Verr. April, Central wood.

SCHIZOPHORA—ACALYPTERA

OTITIDAE

Seioptera vibrans L. June, Bayfield plain.

PALLOPTERIDAE

Palloptera trimacula Mg. pupae found in the stems of *Angelica sylvestris* L. on 11 Dec., 1949. Flies emerged 20 April, to 6 May, 1950. L.P. 29 May, 1950, M. Niblett. A male was taken on *Angelica sylvestris* L. on 28 Aug., 1949, on Central plain by P. W. E. Currie.

TRYPETIDAE

Mr. Niblett's intensive study, resulting in his paper "The Distribution of Trypetidae (Diptera)" (Niblett, 1953), included four species additional to our original list published in 1950:—*Acidia cognata* (Wied.), *Chaetostomella onotropes* (Lw.), *Terrellia serratulae* (L.) and *Zonosema alternata* (Fln.).

LONCHAEIDAE

Dasyops latiterebra (Czerny) June, Western Hollow.
Earonyiya nigra (Mg.) June, Eastern wood.
E. virilis Collin a male taken on 18 May, 1941.
Lonchea laticornis Mg. pupa found under bark; a male emerged on 19 April, 1949.

SAPROMYZIDAE

Minettia inusta (Mg.) a female found as prey of the spider *Dictyna uncinata* Westr. (determined by G. H. Locket) on 11 June, 1950, in Stents wood.
M. longipennis (F.) a male taken on 11 June, 1950.

PSILIDAE

Loxocera aristata (Panz.) June, Central plain, on leaves of wild parsnip, *Pastinaca sativa* L.

SEPSIDAE

Sepsis flavimana Mg. May, Hill House wood and Sept., visiting flowers of Burnet Saxifrage, *Pimpinella saxifraga* L., Isle of Wight plain.
S. nigripes Mg. March, April, in grass tufts, in open clearing in Central wood and near Isle of Wight pond.

S. violacea Mg. taken on 1 Sept., 1935.

Themira nigricornis (Mg.) June, Bayfield plain.

CHAMAEMYIIDAE

Leucopis annulipes Zett. June, Bayfield plain.

HELOMYZIDAE

Allophyla atricornis (Mg.) Sept., on the leaves of Sycamore *Acer pseudoplatanus* L. in Hill House wood.

Helomyza pallida Fln. Oct., South Eastern wood.

CHYROMYIDAE

Chyromya flava (L.) bred by S. Wakely from a nest of the wasp, *Vespula germanica* (F.). Flies emerged 19 to 21 May, 1952.

CLUSIIDAE

Clusiodes albimana (Mg.) May, about fallen tree trunk. Hill House wood.

ANTHOMYZIDAE

Anthomyza gracilis Fln. July, in long grass, near Isle of Wight pond.

EPHYDRIDAE

Hyadina guttata (Fln.) March, April, May, in grass tufts at Eastern plain, Eastern Hollow and the margin of the Isle of Wight pond.

Hydropota cardamines (Hal.) Aug., in *Juncus* at the margin of the Isle of Wight pond.

H. thoracica (Hal.) Aug., in *Juncus* at edge of the Isle of Wight pond.

Limnella quadrata Fln. Nov., South Eastern wood.

SPHAEROERCERIDAE

Borborus ater Mg. March, Central plain and Central wood.

Collinellula cryptochaeta (Duda) Jan. to May, found on a dead Blackbird and in grass tufts, Eastern plain, edge of Isle of Wight pond and Western Hollow.

C. palustris (Collin) March, April, on fresh horse dung, in *Juncus* clump, edge of Upper Eastern pond, Western plain and Isle of Wight marsh.

Coprophila ferruginata (Stenh.) Nov., on dead mole, Central plain.

Limosina silvatica (Mg.) Jan., on horse dung, Central plain.

Sphaerocera paracrenata Duda, Feb., in grass tufts, Eastern plain.

ASTEIDAE

Leiomyza laevigata (Mg.) June, Bayfield plain.

DROSOPHILIDAE

Our member E. B. Basden has kindly examined all my specimens.

Drosophila forcipata Collin Nov., South Eastern wood.

D. kuntzei Duda Oct., Bayfield plain.

D. melanogaster Mg. Aug., Oct., visiting flowers of Large Bindweed, *Calystegia sepium* (L.) Roem. & Schult and flowers of Ivy, *Hedera helix* L. and fresh Stinkhorn fungus, *Phallus impudicus* Pers., Central and South Eastern woods.

D. subobscura Collin Feb., June, on sodden bread, Eastern plain, also on Bayfield plain.

Scatomyza griseola (Zett.) March, Central wood.

AGROMYZIDAE

My collection of these flies and their mines have been examined by Dr. E. M. Hering of Berlin, to whom my grateful thanks are tendered.

Agromyza alnibetulae Hd. larvae found in June to Sept., mining leaves of Birch, *Betula pendula* Roth.

A. cinerascens Macq. captured by C. N. Colyer on 11 April, 1948.

A. dipsaci Hd. larvae found in July mining the leaves of Teasel, *Dipsacus fullonum* L.

A. (Domiomyza) mobilis Mg. June, Sept., Oct., South Eastern wood, found in a spider's web.

A. nana Mg. larvae in June to Oct., found mining the leaves of White Clover, *Trifolium repens* L. and Red Clover *T. pratense* L.

A. nigripes Mg. captured 14 May, 1942, in a clump of *Juncus* growing in the ditch of Isle of Wight plain.

A. nigrociliata Hd. captured on 25 May, 1953.

A. reptans Fln. adult flies captured in Sept. in Central wood on the leaves of nettles, *Urtica dioica* L. in which larvae mine June to Nov.

Liriomyza amoera (Mg.) larvae found in June to Oct. in the leaves of Elder, *Sambucus nigra* L.

L. flaveola (Fln.) captured on 25 May, 1953, and 10 July, 1949, also larvae in mines found in June to Oct., in blades of the grass Yorkshire Fog, *Holcus lanatus* L.

L. sonchi Hd. larvae found in August, mining the leaves of Corn Sowthistle, *Sonchus arvensis* L.

L. strigata (Mg.) larvae found in June to August mining leaves of Corn Sowthistle, *Sonchus arvensis* L. and Knapweed, *Centaurea nigra* L.

L. taraxaci Hg. larvae found in June to August, mining leaves of Dandelion, *Taraxacum officinale* Weber.

L. trifolii (Burgess) larvae found in July to Sept., mining leaves of Meadow Vetchling *Lathyrus pratensis* L., and Tufted Vetch, *Vicia cracca* L.

Melanagromyza aeneiventris (Fln.) reared in June, 1951, from pupae found in the stems of *Angelica sylvestris* L. on 6 May, 1951 (M. Niblett, 1952).

M. lappae (Lw.) a male captured on Central plain on 8 June, 1952. Flies reared on 3 June, 1950, from pupae found in the cambium of stems of Hogweed, *Heracleum sphondylium* L.

M. niblettii Spencer reared from Pepper Saxifrage, *Silaum silaus* (L.) Schinz & Thell. Holotype 6 Aug., 1951, paratypes 6 and 8 July, 1951 (M. Niblett) and 3 April, 1957 (K. A. Spencer). K. A. Spencer in *Proc. R. ent. Soc. Lond. (B.)* 26: 180.

M. pulicaria (Mg.) larvae found in May, mining leaves of Dandelion, *Taraxacum officinale* Weber.

M. sativae Spencer Paratypes reared May, June, 1956, from stem of Wild Parsnip, *Pastinaca sativa* L. K. A. Spencer *Proc. R. ent. Soc. Lond. (B.)* 26: 181-2.

M. torilidis Spencer Holotype and paratypes reared from pupae from stems of Upright Hedge Parsley, *Torilis japonica* (Houtt.) DC. flies emerging 17-24 May, 1956, K. A. Spencer *Proc. R. ent. Soc. Lond. (B.)* 26: 182.

Napomyza glechoma (Kalt.) flies taken on 6 May, 1951, about Ground Ivy, *Glechoma hederacea* L. Larvae found mining leaves April to Nov.

N. lonicerella Hd. larvae found in June to Nov., mining the leaves of Honeysuckle, *Lonicera periclymenum* L.

N. xylostei (Kalt.) a male reared May, 1949, from a mine in leaf of Honeysuckle, *Lonicera periclymenum* L. found on 14 November, 1948. Larvae found June to Aug. as well.

Ophionyia heracleivora Spencer Holotype reared 8 Feb., 1957, from puparia collected 17 Sept., 1956, in the base of rotting leaves of Hogweed, *Heracleum sphondylium* L., K. A. Spencer *Proc. R. ent. Soc. Lond. (B.)* 26: 112-3.

O. proboscidea Str. a female captured on 25 May 1941.

O. senecionina Hg. reared from stems of *Senecio* sp. by M. Niblett, K. A. Spencer *Ent. Gazette*, 8, 26

Phytomyza hendeliana Hg. larvae found in May to Oct., mining the leaves of Honeysuckle, *Lonicera periclymenum* L.

P. lonicerae (R.D.) a male captured 23 March, 1951; larvae found in May and June mining the leaves of Honeysuckle, *Lonicera periclymenum* L.

P. tremulae Hg. larvae in August, mining the leaves of Aspen, *Populus tremula* L.

Phytobius (Poemyza) atra (Mg.) June, Central plain.

P. (Trilobomyza) labiatarum (Hd.) larvae in June to Oct., mining the leaves of Hedge Woundwort, *Stachys sylvatica* L.

P. (Dizygomyza) luctuosa (Mg.) a male captured on 1 Sept., 1935, and one on 14 May, 1942, in an area of *Juncus* on Isle of Wight plain.

P. (Poemyza) pygmaea (Mg.) larvae found in July and August, mining the leaves of Oatgrass, *Arrhenatherum elatius* (L.) Beauv. est J. & L. Presl.

P. (Poem.) pygmella (Hg.) captured on 10 June, 1951.

P. (Poem.) semiposticata (Hd.) captured on 1 Sept., 1935.

Phytomyza affinis Fln. July found near Isle of Wight pond and resting on bracken on Central plain. Found mining the leaves of *Centaurea nigra* L. May, 1954, parasite reared 11 June, 1954, *Rhizarcha nitetis* Nixon (Hym. Braconidae) G. C. D. Griffiths, *Ent. mon. Mag.*, 92: 27. Also larvae found in July to Oct., mining leaves of *Cirsium arvense* (L.) Scop.

P. albipennis Fln. a female captured on 12 June, 1949.

P. angelicae Kalt. mines in leaves of *Angelica sylvestris* L., flies reared 20 to 26 April, 1952. Larvae found in May, August and September.

P. angelicastri Hg. larvae found in July to September, mining leaves of *Angelica sylvestris* L.

P. anhrisci Hd. larvae found in May, August, September, November, mining the leaves of Keck, *Anthriscus sylvestris* (L.) Hoffm. near Lower Eastern pond and as early as 14 Jan. A female captured in South Eastern wood on 12 Dec., 1948.

P. atricornis Mg. larvae found mining Fleabane, *Pulicaria dysenterica* (L.) Bernh., Hoary Ragwort, *Senecio erucifolius* L., Bur-Marigold *Bidens tripartita* L. Also found mining the leaves of a "Cineria" *Senecio cruentus* DC. at Bayfield Hotel. Larvae found March to December.

P. chaerophylli Kalt. larvae found in June and July, mining the leaves of *Chaerophyllum temulentum* L.

P. conii Hg. larvae found in June, in mines in leaves of Hemlock, *Conium maculatum* L.

P. conyzae Hd. larvae found in June to Oct. in mines in Fleabane, *Pulicaria dysenterica* (L.) Bernh.

P. lappina Gour. larvae found in June to Oct., mining the leaves of Great Burdock, *Arctium lappa* L.

P. leucanthemii Hg. empty mines found in Ox-eye daisy, *Chrysanthemum leucanthemum* L. on 3 July, 1955—Field Meeting report *Proc. S. Lond. ent. nat. Hist. Soc.*, 1955: 77.

P. melana Hd. larvae found in June, August to October, mining the leaves of Burnet Saxifrage, *Pimpinella saxifraga* L.

P. milii Kalt. captured in March and April, in grass tufts and long grass about Sheepbell pond, at Kelseys Clearing and on Eastern plain.

P. notata Mg. empty mines found in the leaves of Creeping Buttercup, *Ranunculus repens* L.

P. obscurella Fln. larvae found in June to August and October, mining the leaves of Goutweed, *Aegopodium podagraria* L.

P. pastinacae Hd. mines found in July to November, mining in the leaves of Wild Parsnip, *Pastinaca sativa* L., flies reared in May, 1953.

P. periclymeni de Meij. mines found in the leaves of Honeysuckle, *Lonicera periclymenum* L. 3 July, 1955—Field Meeting Report. *Proc. S. Lond. ent. nat. Hist. Soc.*, 1955: 77.

P. primulae R.D. larvae found in June to September, mining the leaves of Primrose, *Primula vulgaris* Huds.

P. pubicornis Hd. larvae found in May, mining the leaves of Goutweed, *Aegopodium podagraria* L.

P. raniosa Hd. larvae found in July, mining the leaves of Teasel, *Dipsacus fullonum* L.

P. silai Hg. mines found in August in the leaves of Pepper Saxifrage, *Silaum silaus* (L.) Schinz & Thell. G. C. D. Griffiths reared its parasite *Priapsis dice* Nixon (Hym. Braconidae), *Ent. mon. Mag.*, 92: 28.

P. spondylii R.D. larvae found in mines of leaves of Hogweed, *Heracleum sphondylium* L. reared Sept., 1952. Larvae found June to August and in October.

MILICHIIDAE

Phyllomyza securicornis Fln. a male captured on 14 May, 1950, under the oak tree at the lunch place by the Isle of Wight pond.

CHLOROPIDAE

Chlorops serena Lw. captured on 10 June, 1951, and identified by J. E. Collin.

Dicraeus vallaris Collin a male captured on 12 June, 1948, along the Central plain ditch.

Elachiptera brevipennis (Mg.) March, April, in grass tufts on Bayfield plain and at margin of Isle of Wight pond.

Oscinissoma cognata (Mg.) captured on 8 April, 1951, in grass tufts at the margin of the Isle of Wight pond and identified by J. E. Collin.

Triciniba lineella (Fln.) Duda June, Bayfield plain.

TACHINIDAE

Blepharomyia amplicornis (Zett.) a male captured in Central wood on 14 May, 1950.

Brachicheta strigata (Mg.) a female found on the trunk of an oak tree, Central wood on 27 March, 1948.

Dexia rustica (F.) a male captured on 11 Sept., 1949.

Exorista simulium (Mg.) a male captured on 10 July, 1949.

Ocyptera interrupta Mg. a male found on bracken, near Bank's Cottage on 29 June, 1947 by P. W. E. Currie.

Phebellia glauca (Mg.) a female captured on 11 July, 1948, in Stents wood.

Servillia lurida (F.) May, Hill House wood and Western plain.

Zenillia insidiosa R.D. = *roseanae* B. & B. reared 10 July, 1952, from Large Marbled Tortrix, *Sarrothripus revayana* Scop. (Lep., Hylophilidae) by S. Wakely.

CALLIPHORIDAE

Blaesoxiphia laticornis (Mg.) a female taken on Eastern plain on 8 July, 1947. W. Ruttledge reared a specimen, identified by Dr. F. van Emden, from the grasshopper *Chorthippus parallelus* (Zett.) on 21 June, 1951.

Macronichia polydon (Mg.) reared on 2 April, 1950, from the nest of *Clytochrysus cavifrons* (Thoms.) (Hym., Sphecidae), found on Eastern plain.

Melinda caerulea (Mg.) this was incorrectly printed as *Melina caerulea* in the original list of 1950.

Onesia aculeata (Pand.) male taken on 17 May, 1942, in Kelseys wood.

Pachyophtalnus signatus (Mg.) a male captured on the 14 May, 1950, in Central wood.

Sarcophaga haemorrhoa Mg. June, Bayfield plain.

S. nigriventris Mg. July, Eastern plain.

MUSCIDAE

My friend E. C. M. d'Assis Fonseca has helped greatly in the identification of the specimens of this family.

Achanthiptera inanis (Fln.) reared on 1 June, 1952, from a nest of the wasp, *Vespula germanica* (F.) by S. Wakely.

Acroptena ambigua (Fln.) August, margin of Isle of Wight pond.

Botanophila varicolor (Mg.) a female taken on 9 June, 1935.

Caricea intermedia (Fln.) July, Eastern plain and Lower Eastern pond.

C. tigrina (F.) August, in marsh by the Isle of Wight pond.

Che'isia monilis (Mg.) July, Sept., in long grass—Eastern Hollow and near the Isle of Wight pond.

Chiroisia setifemur (Ringd.) taken on 10 June, 1951, on bracken.

Coenosia distinguens Collin August, in marsh by the Isle of Wight pond.

C. lineatipes (Zett.) June to Oct., Bayfield and Eastern plains, Lower Eastern pond.

C. infantula Rond. Sept., on bracken, on Glade path.

C. pulicaria (Zett.) July, Central plain.

Craspedochaeta pullula (Zett.) April, August, swept from reeds and sedges.

Delia cepetorum (Mde.) May, Hill House and Stents woods.

D. cilicura (Rond.) April and July, by the Isle of Wight pond and on Eastern plain, visiting flower of Large Bindweed, *Calystegia sepium* (L.) R.Br.

D. exigua (Mde.) May, Bayfield plain and Stents wood.

D. intersecta (Mg.) March, April, resting on path, on leaves of oaks and hollies along the paths in Central, Kelseys and Stents woods.

Fannia aerea (Mg.) August, female visiting flower of Wild Parsnip, *Pastinaca sativa* L., Central plain.

F. pallitibia (Rond.) Sept., females found resting on leaves of Sycamore tree, Hill House wood.

F. polychaeta (Stein) August, Central wood.

F. serena (Fln.) May, June, Western wood.

F. similis (Stein) a male captured on 15 June, 1938.

F. vesparia (Mde.) eight males and three females reared between 22 and 28 May, 1953, from a nest of the wasp, *Vespula germanica* (F.) by S. Wakely.

Hebecnema affinis Mall. May, June, Oct. Western plain and on vegetation of the Isle of Wight ditch.

Helina allotalla (Mg.) August, in an area of *Juncus* at the margin of the Isle of Wight pond.

H. depuncta (Fln.) sucking blackberries on Central plain in Sept., but found resting on leaves of oak trees and on bracken in Oct. in Central and South Eastern woods.

H. marmorata (Zett.) a male taken on 12 June, 1941.

H. obscurata (Mg.) July, Lower Eastern pond.

Hydrotaea militaris (Mg.) June, Eastern wood.

H. occulta (Mg.) the males cruise up and down under oak trees at the lunch place by the Isle of Wight pond in May. A female was found on a dead Rabbit on 14 May, 1942.

Hylephila personata Collin A male taken by A. E. le Gros on 23 May, 1953.

Lispocephala alma (Mg.) a female found in long grass by South Eastern pond on 27 April, 1947.

Mydaea scutellaris R.D. July, Eastern wood.

Nupedia dissecta (Mg.) April, May, August, visiting flowers of Creeping Buttercup, *Ranunculus repens* L. and of Wild Parsnip, *Pastinaca sativa* L. in Western Hollow and Central plain.

N. latipalpis (Lw.) Collin May, Station copse.

Oplogaster mollicula (Fln.) July, Eastern wood.

Paregle aestiva (Mg.) visiting the flowers of Creeping Buttercup, *Ranunculus repens* L. in May.

Pegohylemyia fugax (Mg.) May, July, Sept., about the ponds from Isle of Wight to Upper Eastern pond.

Pegomya dentiens Pand. from pupae found in stems of Meadow-sweet, *Filipendula ulmaria* (L.) Maxim. in Oct., flies were reared by M. Niblett in the following April.

P. flavipes (Fln.) Aug., Central wood.

P. haemorrhoa (Zett.) found on leaves of hazel, on 14 May, 1942, Sheepbell wood.

P. hyoscyami (Panz.) empty mines found in leaves of Bittersweet, *Solanum dulcamara* L. were attributed to this species by Dr. E. M. Hering. form biol. *chenopodii* (Rond.) larvae mining the leaves of Allseed, *Chenopodium polyspermum* L. 9 August, 1953, identified by Dr. E. M. Hering.

P. seitensettensis (Strobl) larvae found mining the leaves of Wood Sorrel, *Oxalis acetosella* L. by G. C. D. Griffiths on 3 July, 1955 [Recorded as *P. steini* Hend. in error in *Proc. S. Lond. ent. nat. Hist. Soc.*, 1955: 77, confirmed G. C. D. Griffiths.]

P. ulmaria (Rond.) July and Sept. visiting flowers of *Ranunculus repens* L.

P. univittata (V.Ros.) Sept., resting on the leaves of Sycamore, tree, Hill House wood.

Phaonia fuscata (Fln.) April, May, resting on tree trunks.

Phorbia genitalis (Schnab.) a male taken on a leaf of oak tree by the path in Kelseys wood, on 9 April, 1946.
P. unipila (Karl) Sept., Central wood.
Pseudocoenosia longicauda (Zett.) August, in marsh by the Isle of Wight pond.
Stomoxys calcitrans (L.) August, margin of Isle of Wight pond.

REFERENCES

ON BOOKHAM

CARRINGTON, L. I., *et al.*, 1944, Some Preliminary Notes on the Birds of Bookham Common. *Lond. Nat.* for 1943, 23-29.
 JONES, A. W., 1954, The Flora of Bookham Common. *Lond. Nat.*, 33, 25-47.
 NIBLETT, M., 1951, Plant Galls in Surrey, 1950. *Lond. Nat.*, 30, 11-13.
 —, 1952, Notes on some Diptera of Bookham Common, 1951. *Lond. Nat.*, 31, 47-49.
 —, 1953, The Distribution of Trypetidae (Diptera). *Lond. Nat.*, 32, 48-51.
 —, 1956, The Flies of the London Area: III, Trypetidae. *Lond. Nat.*, 35, 82-88.
 —, 1957, The Gall Midges (Cecidomyiidae) of Bookham Common. *Lond. Nat.*, 36, 51-54.
 NYE, E. R., 1955, The Flies of the London Area: II, Culicidae, Sub-Family Culicinae (Mosquitoes) *Lond. Nat.*, 34, 114-126.
 PARMENTER, L., 1952, The Flies of the London Area: I, Conopidae. *Lond. Nat.*, 31, 25-29.
 —, 1950, The Diptera of Bookham Common. *Lond. Nat.*, 29, 98-133.

OTHER REFERENCES

ELTON, C., 1933, The Ecology of Animals. London.
 MILES, P. M., 1952, The Entomology of Bird Pellets. *Amat. Ent. Soc. Leaflet*, 24, 1-8.
 OWEN, D. F., 1956, The food of nestling Jays and Magpies. *Bird Study*, 3, 257-265.
 PARMENTER, L., 1958, Flies (Diptera) and their Relations with Plants. *Lond. Nat.*, 37, 115-125.
 —, and OWEN, D. F., 1954, The Swift. *Apus apus* L., as a predator of flies. *J. Soc. Brit. Ent.*, 5, 27-33.
 WITHERBY, H. F., *et al.*, 1938, The Handbook of British Birds. London.

The Aquatic and Wasteland Plants of Bookham Common

By A. W. JONES

In the years 1951 to 1956 surveys were made of the Ponds and Hollows, the streams, the site of a water pipeline, and waste places generally. It became apparent whilst making these seemingly unconnected surveys that the flora of the different habitats often had much in common and this paper attempts to show the dual nature of many of the plants involved. First, however, we will deal with the four individual surveys.

PONDS AND HOLLOW

These were surveyed in 1951 and 1952 and may be grouped thus:—

1. The Hollows Valley including three major ponds and two hollows.
2. Sheepbell Pond.
3. Minor Ponds.

THE HOLLOW VALLEY

The Ordnance Survey 1 inch map of 1887 shows five ponds in this valley and they are now represented (from east to west) by U.E. Pond, L.E. Pond, East Hollow, West Hollow and I.o.W. Pond (see sketch map on page 78). They have many points in common and are therefore treated here as a group. The whole valley is bordered with woods except for a small area on the south border of the east end of E. Hollow. The fall from the head of Greendell Ditch (to the immediate east of U.E. Pond) to I.o.W. Pond is 25 feet. The five units are now considered in detail, followed by suggestions as to the succession that probably took place.

1. I.o.W. POND

In the west *Sparganium erectum* stretched a little way along the north and south sides, almost enclosing a large area of *Equisetum fluviatile*

which was bounded on the east by a thick growth of *Typha latifolia*. The area thus described is the pond as shown on modern maps, and the north-east and south-east edges were bordered by *Salix cinerea*. Although the area was completely dry in 1952 it did not dry up in the six years following.

Further to the east were two extensive areas of *Salix cinerea*, one in the north and another in the south, followed by yet another line of scattered bushes as far as the west dam of West Hollow. East of the *Typha latifolia* was a mixture of *Sparganium erectum*, *Equisetum fluviatile* and *Galium palustre*, which does not fit in at all well with the general pattern of the pond. This was followed by a marshy area with a local dominance of *Ranunculus repens* and *Juncus effusus*, which gave way to a very mixed vegetation in the extreme east.

The pond could thus be divided into the pond proper, and a marsh to the east.

A small square pit dug in December, 1948, in the south-west corner, for clay to reinforce the dam, supported a shallow open-water community of *Potamogeton natans*, *Ranunculus aquatilis*, *Apium inundatum*, etc.

2. L.E. POND

The dam here was repaired shortly after the Second World War. *Sparganium erectum* dominates the west and *Equisetum fluviatile* the east with a border of mixed marsh vegetation including only a little *Epilobium hirsutum*. The north and south and to a lesser extent, the east are bordered with *Salix cinerea*.

3. U.E. POND

This was the most permanent pond in the valley, retaining some water even in the dry summer of 1952.

Sparganium erectum was found only in the north-west and south-west corners, *Equisetum fluviatile* occupying the west half and *Epilobium hirsutum* the east half, of the rest of the pond, with a border of *Salix cinerea* in the north-east, east and south.

4. WEST HOLLOW

Epilobium hirsutum was more or less dominant here with a mixed marsh vegetation.

Salix cinerea bordered the north, east, and south but did not occur in the central portion. In the summer of 1954 it was cut down along the north edge together with part of the wood behind but the *Salix cinerea* merely suckered from the old stools.

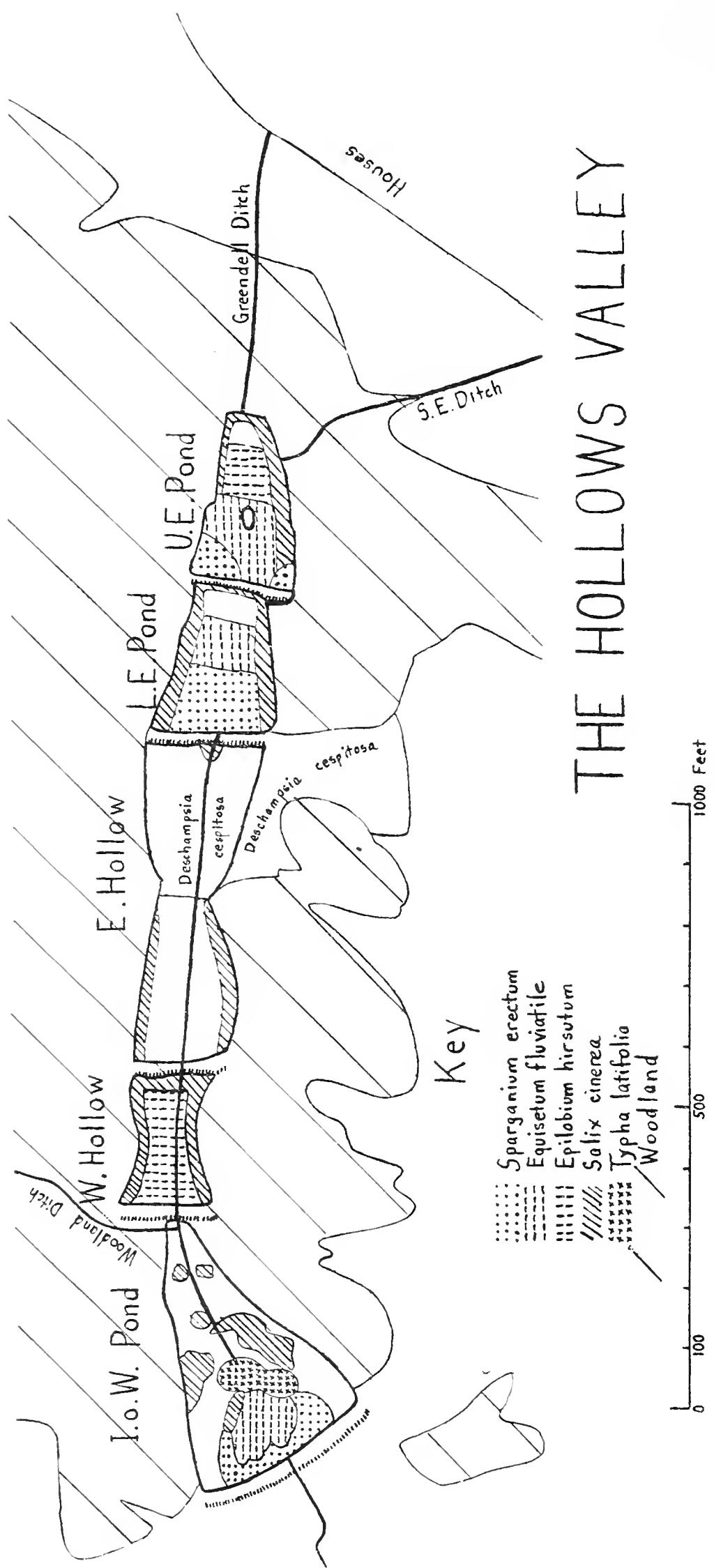
5. EAST HOLLOW

The west half was very wet (but less so than West Hollow) and a mixed vegetation occurred with *Epilobium hirsutum* only scattered; *Salix cinerea* only bordered the south and north and slightly at the east end, not occurring in the central portion.

The east half, which was marshy along the stream, was largely dominated by *Deschampsia cespitosa* with characteristic associated flora. *Salix cinerea* was absent from the borders of this half, occurring only in the marshy area.

6. SUCCESSION

It would appear that in 1887 there were five ponds in this valley but since then the ponds have become progressively more overgrown and silted up and two of the dams are permanently broken. The succession that



has followed in the last 70 years has not been recorded but, as the vegetation of each of the ponds is perhaps at a different stage, some inferences of their evolution can be drawn.

It has been suggested that these ponds are quite ancient, being originally formed by the damming up of the valley at five points for fish ponds. Harvey (1943) says one existed as a fish pond in 1816. In each of the ponds the deeper end would have been by the dam which would also be the wider, the eastern end being very shallow and narrower. As the fall over the ponds is 25 feet and there would have been five dams, each would have been approximately 5 feet high to put the whole valley under water.

Marsh vegetation would develop rapidly at the east ends of the ponds where the water would be very shallow and this would collect silt.

A reduction in the amount of water in the ponds could arise from:—

- (a) Dry summers.
- (b) Breaking of the dam.
- (c) Changes in drainage—Greendell Ditch now continues no further back than the edge of the Common where there is a very small garden pond; it appears that there was once further drainage into it from the east but building may have affected this. The chief drainage is presumably from the northern woods of the Common although the ditches from the woods are more or less derelict and now rarely contain water. S.E. Ditch is now permanently dry.
- (d) Silting up and general growth of vegetation raising the beds of the ponds (though this would not necessarily affect the water level). Plants of open water would probably be the first to appear in the ponds and may have been introduced. *Potamogeton* spp., *Myriophyllum alterniflorum*, *Ranunculus aquatilis* and *Elodea canadensis* are amongst those recorded in recent years.

Marshland plants developing at the eastern ends would tend to advance westwards as the pond silted up and their place taken by plants requiring dryer habitats. If the assumption of an encroachment of marsh vegetation from the east is feasible, the present westerly flora will have been the first to arrive in the ponds and so on. The zonation of such species as are dominant in parts of each of the ponds from west to east seems to be:—

- (a) *Sparganium erectum*
- (b) *Equisetum fluviatile*
- (c) *Epilobium hirsutum*
- (d) Mixed.
- (e) *Deschampsia cespitosa* (if E. Hollow at the east end was ever under water).

Another feature is the growth of *Salix cinerea* at the edge of the water line where it germinates on the bare mud.

The whole valley is bordered with woods except for a small area on the south border of the east end of E. Hollow. Many other ponds on the Common are bordered by woods and some are deeply shaded but in none was there any marked invasion by woodland plants. Usually an encroachment of two or three yards was the limit and presumably the areas were still extremely wet with the water level only just below the ground.

In the I.o.W. Pond there were a number of lines of *Salix cinerea* presumably representing various old limits of the pond. They do not, however necessarily indicate continuous falls in the water level as they could well be formed after an increase of surface water. In the years following the survey the clump of *Typha latifolia* increased and the species started

to colonize an area in the middle of the west side, ousting the *Sparganium erectum*. Selby (1955) points out that in the Epping Forest Ponds the rhizome of *Typha latifolia* grows within an inch of the surface of the mud and is 1-1½ inches thick and easily ousts the thinner rhizomes of *Sparganium erectum* which also occur near the surface.

When the dam was repaired shortly after the Second World War, L.E. Pond would have had the greatest water surface for many years. This appears to have encouraged the growth of *Sparganium erectum* which was only locally dominant in 1944 when the centre of the pond was covered by *Equisetum fluviatile* surrounded by a mixed marsh vegetation (including *Sparganium erectum*). As will be seen these two plants had by 1952 occupied three-quarters of the pond between them.

In U.E. Pond the only noteworthy change in recent years was that *Equisetum fluviatile* appeared to have encroached as far as the west edge since 1944.

The broken dam of West Hollow resulted in the absence of any permanent standing water. Probably the water drained out within a short time of the break as the *Salix cinerea* is confined to the borders and does not occur in the central parts as would have been the case had there been several widely separated falls in the level of the former pond. *Equisetum fluviatile* has disappeared from W. Hollow although *Sparganium erectum* still occurs. It would thus appear that, although *Sparganium erectum* is pushed out by *Equisetum fluviatile* on a slowly falling water level, complete drainage eliminates *Equisetum fluviatile* first.

The west half of East Hollow was bordered by *Salix cinerea* but the bushes did not occur in its central portion so probably the water drained out in a short time after the dam was broken, as in West Hollow. Likewise there was a little *Sparganium erectum* left but no *Equisetum fluviatile*. The absence of *Salix cinerea* from the borders of the east half of East Hollow suggests that the area was never permanently under water. It is strange that this half dominated by *Deschampsia cespitosa* adjoins the *Molinia caerulea* area of E. Plain, the latter plant being sparse in E. Hollow.

SHEEPBELL POND

This was deeply shaded and had few interesting plants in it; nevertheless it was the most permanent of the ponds, the water level appearing to be constant at all times of the year.

The pond was normally covered with *Lemna polyrhiza* and *L. minor* but in the winter of 1953/54 it was noticed that the liverwort *Riccia* "fluitans" agg. had achieved a sudden dominance. Since then *Riccia* has remained dominant in the winter and co-dominant with the two Lemnads in the summer. No records of *Riccia* "fluitans" agg. prior to 1953 are known for the Common but it was recorded for Crater 264 in April, 1956, Lower Eastern Pond in Nov., 1957, and Bayfield Pond in May, 1959.

MINOR PONDS

These are:—

1. Bayfield Pond. This pond was very shallow with no surface water for long periods in most summers. A marsh vegetation occurred in the south-east but the other half of the pond was rather barren although *Ranunculus aquatilis*, *Potamogeton natans* and *Callitricha* sp. each covered a fair area in their respective seasons. It is shaded by a number of old *Salix fragilis*, four probably being 100 years old.

2. S.E. Pond. This pond is dry in most summers and shaded by trees on all sides. The vegetation had changed remarkably since 1944, *Agrostis canina* becoming dominant along the N.W., W. and S. edges and *Solanum dulcamara*, a striking feature in the autumn of 1944, was no longer frequent. A number of *Salix cinerea* bushes formed a rough circle at some distance from, and within the edges of, the pond. Inside this, *Sparganium erectum* remained dominant and also occurred outside the circle to the north and east, this being a very different habitat from that in Hollow Valley. *Equisetum fluviatile* was not present.

3. Kelseys Pond. Shaded by trees on three sides, this pond was used by cattle which approached it from the north. It dried up completely in most if not all summers and had little vegetation, although when the pond is dry *Callitricha* sp. was fairly extensive on the mud. It does not appear to have changed since 1944.

4. Manor Pond. This had Bookham Stream running through it and was consequently always very marshy but had little claim to be a pond. *Sparganium erectum*, *Epilobium hirsutum* and *Mentha aquatica* are co-dominant.

5. W. Pond. This was only a marsh occurring further down Bookham Stream (and slightly to one side of it).

6. Banks Pond. Still further down Bookham Stream it had become almost merged into the general vegetation of the plain and its only distinction was the occurrence of *Oenanthe fistulosa* which is found nowhere else on the Common.

7. Little I.o.W. Pond (Map reference 5712). This is very small (a few yards long), was shaded by a large *Salix cinerea* and dried up very quickly in the summer. It supported *Symphytum officinale* and *S. peregrinum*.

8. Three Mark Oak Ponds. These are all very small and deeply shaded and the principal plants were *Juncus effusus* and *Solanum dulcamara*.

9. Four Bomb-Craters (Map references 264, 544, 736 and 766). The first three contained permanent water despite their small size. Crater 264 was the only locality for *Scirpus fluviatilis* on the Common. The chief vegetation of Crater 544 was a colony of *Typha latifolia* and of Crater 736, *Sparganium emersum* and *Eleocharis palustris*. These crater ponds have been dealt with by Castell (1955).

The flooded Gun-Pits on Eastern Plain have not been included in this paper, the vegetation having been dealt with by Bangerter and Castell (1949 and 1951).

STREAMS

In 1955 a survey was made of the chief streams, each of which was divided up into divisions of approximately equal length: Bookham Stream into 6, Banks Stream 2, I.o.W. Ditch 3, and Central Ditch 4, a total of 15 divisions.

It soon became obvious that most of the plants occurring along the banks were not aquatics. Their presence was chiefly due to the wasteland habitat created by mud being thrown on the banks when the ditches were 'cleared'. *Epilobium hirsutum* often dominated a border for some yards on either side of many parts of the streams, often spreading into the stream itself, with *Calystegia sepium* twining over it. *Urtica dioica* was often abundant along the banks. *Conium maculatum* was locally

abundant along I.o.W. Ditch and Bookham Stream, occasional along Banks Stream, but appeared absent from Central Ditch.

The vegetation of the stream beds was very sparse indeed. *Epilobium hirsutum* often spread into the beds but otherwise *Apium nodiflorum* was the most frequent plant with occasional *Scrophularia aquatica*, *Mentha* sp., *Myosotis scorpioides*, *Rorippa nasturtium-aquaticum* and *Glyceria fluitans* agg.

PIPELINE

In September, 1954, a trench about 5 feet deep was dug from Hundred Pound Bridge to the Tunnel. From Hundred Pound Bridge it ran to the west of, and roughly parallel to, Common Road (varying up to 20 yards away from it in Western Plain) until it reached Eastern Ditch when it crossed over to the east of Common Road (and never more than a yard from it) until it ceased just short of the Tunnel. A water pipe was laid in this trench and the earth replaced. This left a belt of bare earth about 5 yards wide right across the Common.

In 1955 this belt was divided up into 9 divisions of approximately equal length and the species in each division listed. Many of the plants recorded were those found in the adjoining plains or woods and these have been largely ignored in the following lists. Many had, for example, sprouted from old roots, etc., or, at most, seeded from plants a few yards away.

It must not be thought that the pipeline quickly reverted to its original flora. In the south it ran through S.E. Wood and the undergrowth in the belt was cleared, allowing a greater growth of woodland herbs. Across Western Plain the dominant *Pteridium aquilinum* was killed and a luxuriant stand of *Deschampsia cespitosa* took its place. The breaking of *Pteridium aquilinum* fronds weakens the plant but although it has some regenerative powers breaking up of the rhizomes usually kills it. In 1956 the 5-yard belt was almost free from *Pteridium*. Also across W. Plain young *Quercus robur* seedlings appeared in the cracks in the clay. If successful these seedling oaks may mark the pipeline in a very permanent way. It seems likely that if they fall in grass, acorns rarely reach the soil and therefore fail to take root, whereas the bare cracks in the clay provide an immediate germinating place. *Holcus lanatus*, which is locally abundant on the plains, became dominant in several places in the belt in I.o.W. Plain and by the I.o.Wight.

WASTES

In 1955 and 1956, 30 areas of disturbed soil or waste places were examined. These were a piece of rough ground by Rydall, used as a car-park, rough ground by the Tunnel, a bomb-crater in S.E. Wood completely overgrown, two disturbed areas and an overgrown allotment by the Shingled House, area by Banks Cottage periodically used for chickens, rough ground by entrance to one of the houses at I.o.Wight, rough ground at High Point, area of recently cleared woodland to north of marshy part at I.o.W. Pond, fresh plantation of trees to south of I.o.W., recently dug ditch (no water) in Central Plain, two small deturfed areas and 16 small dumps of earth, bricks or chalk (chiefly used for making up tracks) in various parts of the Common.

The deturfed areas and the small dumps were poor floristically, supporting mainly a few casuals and some plants from surrounding areas and in all cases only the aquatic and wasteland plants are considered here.

It is tempting when considering dumps of materials to think that the plants occurring are introduced. Similarity to the pipeline does, however, throw doubt on this as the pipeline had no introduction of soil although admittedly seeds could have been introduced on wheels of vehicles. Undoubtedly some are introduced, as for example, a record of *Cymbalaria muralis* (a plant that cannot be considered a wasteland plant), amongst bricks used for making up a track in 1951. Many of the wasteland plants, however, probably exist precariously jumping from one area of disturbed soil to another, on the Common.

THE TABLES

All the plants found in the Surveys which can be considered aquatic or wasteland plants are now listed in five tables according to their general habitats as observed by the writer in Surrey. These tables show to what extent each plant was found in the Surveys—in the case of I.o.Wight, L.E., U.E., and Sheepbell Ponds the frequencies of each plant are given. Fourteen Minor Ponds, two Hollows, 15 divisions of the Streams, nine divisions of the Pipeline and 30 Wastes were observed, and in the tables is shown the number of these in which each species occurs.

The nomenclature adopted in the tables and elsewhere follows Dandy (1958) for scientific names and Rayner (1927) for popular names as far as possible.

Abbreviations used in the tables and elsewhere are:—

r	rare	I.o.W.	Isle of Wight
o	occasional	L.E.	Lower Eastern
f	frequent	S.E.	South Eastern
a	abundant	U.E.	Upper Eastern
d	dominant		
l	local(ly)		
v	very		
c	co-		

Table 1 plants are those that in the author's experience do not grow away from standing or flowing water although some such as *Callitriches* sp. will tolerate a good deal of drying up whereas others such as *Myriophyllum alterniflorum* will not.

The few records for the wastes and pipeline are for wet places.

Nymphaea alba recorded for U.E. Pond was almost certainly washed down from a small garden pond at the top of Greendell Ditch. *Equisetum palustre* occurred on the Common only in what were the three lower ponds of the Hollows Valley, viz., E. Hollow, W. Hollow and I.o.W. Pond in each case at their western ends, and the marsh below I.o.W. Pond.

Table 2 plants are usually associated with standing or flowing water but are occasionally found away from it.

One important feature of the aquatic habitat is the frequent occurrence of bare soil or mud due to a temporary or permanent fall in water level. This appears to provide the connecting link between aquatic, marshland and wasteland habitats and could account for much of their common flora. Bare earth or mud may ensure lack of competition in germination and/or growing periods either above or below ground. In addition the water may distribute seed or parts of plants capable of regeneration.

Of the plants that require bare soil for germination, *Salix cinerea* is prominent, being characteristic of the edges of ponds where it germinates on the bare mud. On the City Bombed Sites it germinated in the early

TABLE 1
AQUATICS AND SEMI-AQUATICS

	I.O.W. Pond	I.O.W. Pond	I.O.W. Pond	Sheepbell Pond	Minor Ponds	Hollows	Streams	Wastes	Pipeline
<i>Equisetum fluviatile</i> (Water Horsetail)	ld	ld	ld						
<i>E. palustre</i> (Marsh Horsetail) ...	o	r			1	1	1	1	2
<i>Ranunculus flammula</i> (Lesser Spearwort) ...							1		
<i>R. sceleratus</i> (Celery-leaved Crowfoot) ...					2				
<i>R. aquatilis</i> (Water Crowfoot) ...	r								
<i>Nymphaea alba</i> (White Water-lily) ...			r		1		2		
<i>Rorippa nasturtium-aquaticum</i> (Water-cress)	r								
<i>Epilobium palustre</i> (Marsh Willowherb) ...	r	r	r	r	2	2			
<i>Myriophyllum alterniflorum</i> (Water Milfoil)					1				
<i>Callitriches</i> sp. (Water-starwort) ...	r			f	4		1		
<i>Hydrocotyle vulgaris</i> (Marsh Pennywort) ...	r		l		2				1
<i>Apium nodiflorum</i> (Procumbent Marshwort)		r	r		2	1	11		
<i>A. inundatum</i> (Least Marshwort) ...	r	r			1				
<i>Oenanthe fistulosa</i> (Tubular Water-dropwort)					1				
<i>Myosotis scorpioides</i> (Forget-me-not) ...	f	f	o	r	2	2	3		
<i>M. secunda</i> (Creeping Forget-me-not) ...						1			
<i>M. caespitosa</i> (Tufted Forget-me-not) ...				r	2				
<i>Veronica scutellata</i> (Marsh Speedwell) ...	r				1				
<i>V. anagallis-aquatica</i> agg. (Water Speedwell)							1		
<i>Mentha aquatica</i> (Water Mint) ...	f	o	f		2	2	4		
<i>Lycopus europaeus</i> (Gipsywort) ...	f	f	o	o	4	2	1		
<i>Stachys palustris</i> (Marsh Woundwort) ...				l			2		
<i>Scutellaria galericulata</i> (Greater Skullcap)				l					
<i>Galium palustre</i> (Marsh Bedstraw) ...	a	o	r		5		2		
<i>Bidens cernuus</i> (Nodding Bur-marigold) ...	o	o	o	o	1				
<i>Alisma plantago-aquatica</i>									
(Greater Water-plantain)	f	f		o	7		1		
<i>Potamogeton natans</i> (Floating Pondweed) ...	l	l	l		2				
<i>P. crispus</i> (Curled Pondweed) ...					1				
<i>Iris pseudacorus</i> (Yellow Iris) ...				o	1		1		
<i>Lemma polyrhiza</i> (Greater Duckweed) ...				cd					
<i>L. trisulca</i> (Ivy-leaved Duckweed) ...	f	o	o		1				
<i>L. minor</i> (Lesser Duckweed) ...	o	o	o	cd	3				
<i>Sparganium erectum</i> (Branched Burreed) ...	ld	ld	ld		4	2			
<i>S. emersum</i> (Un-branched Burreed) ...	r	l			1				
<i>Typha latifolia</i> (Broad-leaved Reedmace) ...	ld				2				
<i>Eleocharis palustris</i> (Marsh Clubrush) ...	f	lf			2		1		
<i>Scirpus fluitans</i> (Floating Clubrush) ...					1				
<i>Glyceria fluitans</i> agg. (Floating Meadow Grass) f	o		f		5		2		

years on the bare dust and rubble, but in neither case does it germinate when the area becomes overgrown. It might be pointed out that *Salix cinerea* is less resistant to drought than *S. caprea* which is included in Table 3. Other plants also found in such permanently dry places are *Rorippa islandica*, *Epilobium hirsutum*, *Salix fragilis* and *S. viminalis*.

Most of the other plants listed are plants found in grassy or disturbed places, or woods which in many cases would be reasonably damp at least at some time of the year.

Scrophularia aquatica although characteristic of ponds and streams is an occasional plant on chalk slopes in Surrey (chiefly by woodland paths). To a lesser extent *Cirsium palustre* and perhaps *Pulicaria dysenterica* have this odd trait.

Table 3 plants are more often found in grassy places (which may or may not be damp) than in ponds and streams. Some of them, e.g. *Equisetum arvense*, can be found in very dry places; on the other hand *Cardamine flexuosa* is found elsewhere only in damp woods.

Solanum dulcamara is exceedingly versatile, its frequent habitats being ponds, streams, chalk downs, hedgerows and dry places such as the City

TABLE 2
PLANTS USUALLY ASSOCIATED WITH WATER

	I.o.W. Pond	L.E. Pond	U.E. Pond	Sheepbell Pond	Minor Ponds	Hollows	Streams	Wastes	Pipeline
<i>Barbarea vulgaris</i> (Winter Cress) ...	...						1	1	
<i>Rorippa islandica</i> (Marsh Yellow Cress) ...	...							
<i>Lycchnis flos-cuculi</i> (Ragged Robin) ...	...							
<i>Stellaria alsine</i> (Bog Stitchwort) ...	...			f	1	2			
<i>Lotus uliginosus</i> (Greater Birdsfoot Trefoil) o					1			6	
<i>Filipendula ulmaria</i> (Meadowsweet) ...	...							
<i>Peplis portula</i> (Water Purslane) ...	...	r			1				
<i>Epilobium hirsutum</i> (Great Hairy Willowherb) f		1	ld		4	2	15	3	
<i>Conium maculatum</i> (Hemlock) ...	...						8	1	
<i>Angelica sylvestris</i> (Wild Angelica) ...	...			1			4		
<i>Polygonum hydropiper</i> (Water Pepper) ...	...	r	r	r	f	3	2	3	4
<i>Rumex conglomeratus</i> (Sharp Dock) ...	...	o	r	o		1	2	8	3
<i>Salix fragilis</i> (Crack Willow) ...	...	r		r		1		2	
<i>S. viminalis</i> (Osier) ...	...							1	
<i>S. cinerea</i> (Grey Sallow) ...	...	ld	o	a	f	8	2	3	2
<i>Lysimachia nummularia</i> (Creeping Jenny) ...	f	o	f			2	2		
<i>Scrophularia aquatica</i> (Water Figwort) ...						1		7	
<i>Mentha x verticillata</i> (Whorled Mint) ...			r				1		
<i>Scutellaria minor</i> (Lesser Skullcap) ...							1		
<i>Galium uliginosum</i> (Bog Bedstraw) ...						2			
<i>Pulicaria dysenterica</i> (Common Yellow Fleabane) o					2	2			
<i>Gnaphalium uliginosum</i> (Marsh Cudweed) ...								1	6
<i>Cirsium palustre</i> (Marsh Thistle) ...	...	1		r	6	2	2	1	2
<i>Juncus bulbosus</i> (Lesser Jointed Rush) ...					1				1
<i>Carex otrubae</i> (Fox Sedge) ...	...	f	o		2	2	5		
<i>Alopecurus geniculatus</i> (Kneebent Foxtail Grass) r									

Bombed Sites. Salisbury (1952) mentions it as a frequent plant of chalk scrub and says it occurs on diverse types of soil, but especially where rich in bases or in hollows or in water where the soil is enriched by bases leached out from higher ground.

It is of course possible that one form of a species may live in dry habitats and another form in wet habitats, this applying to plants in Table 2 as well. *Agrostis canina* in the wet conditions of I.o.W. Pond and S.E. Pond is usually the fasciculate sub-species *canina*. *Glyceria fluitans* agg. listed in Table 1, grows erect in muddy places, but seems to adapt itself to some extent when in deep water by having floating leaves.

Table 4 perennial and biennial wasteland plants are normally able to maintain themselves in competition with grassland vegetation for some years and are not usually considered plants of wet places.

Most of them occurred in the wasteland habitat on either side of the streams caused by the dumping of mud from stream clearing. Mention must be made of some plants whose relations with the streams or ponds cannot, however, be lightly dismissed:—

1. *Anthriscus sylvestris*, although largely a hedgerow plant is to be found occasionally in abundance along streams in Surrey, often occurring as at Bookham Common with *Alliaria petiolata* which is of similar character.
2. *Dipsacus fullonum* is not normally found in wet places but on Bookham Common it was confined to or near to the banks of I.o.W. Ditch,

TABLE 3
PLANTS OFTEN ASSOCIATED WITH WATER

	I.o.W. Pond	L.E. Pond	U.E. Pond	Sheepbell Pond	Minor Ponds	Hollows	Streams	Wastes	Pipeline
<i>Equisetum arvense</i> (Field Horsetail) ...	r	r							
<i>Ranunculus repens</i> (Creeping Buttercup) ...	f	o	r					8	3
<i>Cardamine pratensis</i> (Cuckoo Flower) ...					2		1		
<i>C. flexuosa</i> (Perennial Hairy Bitter Cress) ...							1		1
<i>Hypericum tetrapterum</i> (Square-stalked St. John's Wort)						1	1		
<i>Potentilla anserina</i> (Silverweed) ...	f	o	r				1	4	2
<i>P. erecta</i> (Upright Tormentil) ...	r	r	r						3
<i>Epilobium cf. obscurum</i> (Dull-leaved Willowherb)	r	r	r		4	2	1		5
<i>Salix caprea</i> (Sallow) ...					1	2		3	
<i>Solanum dulcamara</i> (Bittersweet) ...	f	o	r	f	8	2	5	4	4
<i>Mentha arvensis</i> (Corn Mint) ...					1	1			1
<i>Juncus tenuis</i> (Slender Rush) ...								1	
<i>J. bufonius</i> (Toad Rush) ...		r							5
<i>J. inflexus</i> (Hard Rush) ...		o	r		5	2	5		1
<i>J. effusus</i> (Loose-flowered Soft Rush) ...		a	o	f	12	2	9	1	1
<i>J. conglomeratus</i> (Soft Rush) ...	r								
<i>J. acutiflorus</i> (Sharp-flowered Jointed Rush)						1		1	
<i>J. articulatus</i> (Shining-fruited Jointed Rush)	r				2				1
<i>Scirpus setaceus</i> (Bristle Clubrush) ...									2
<i>Carex flava</i> agg. (Yellow Sedge) ...					1				
<i>C. hirta</i> (Hairy Sedge) ...	l	r	r		3	2			
<i>C. remota</i> (Remote-spiked Sedge) ...	r	r	r		2	1			
<i>C. ovalis</i> (Oval Sedge) ...	r								
<i>Agrostis canina</i> (Brown Bent Grass) ...	f	o	1	r	4	1		1	1

Bookham Stream and Banks Stream. This is possibly the only suitable wasteland habitat available to it; the plains and other grassy places normally being too overgrown.

3. *Calystegia sepium*, occasional along streams and in ponds and the Hollows (but also elsewhere), was apparently limited in its distribution on the Common, not, directly by wetness or dryness nor by requiring a wasteland habitat, but chiefly by the occurrence in turn of *Epilobium hirsutum* over which it commonly twines. On the other hand *Calystegia silvatica* was on the Common, confined to a wire fence near Peacedene. Both species are normally found more in wasteland habitats than grassy places.
4. *Urtica dioica* occurs frequently along the streams and many of the ponds and the Hollows but is probably dependent upon the bare soil. *Urtica dioica* is very tolerant of flowing water and occurs, for example, in abundance on the low banks of the Beverley Brook on Wimbledon Common where every winter it is swept by the brook in flood. The creeping stems may well be scoured out and deposited further along where they root. This may be the means of distribution of many stream plants such as *Apium nodiflorum*, *Rorippa nasturtium-aquaticum* and *Epilobium hirsutum*.
5. *Epilobium parviflorum* occurred in several spots in standing water in I.o.W. Pond apparently hybridizing freely with *E. palustre*.

Table 5 annuals are purely casuals and they exist only where there is bare and/or disturbed soil.

Polygonum persicaria is very tolerant of standing or flowing water and in Surrey is occasionally to be found in the water at the edges of ponds

TABLE 4
PERENNIAL AND BIENNIAL PLANTS OF WASTE PLACES

	I.O.W. Pond	L.E. Pond	U.E. Pond	Sheepbell Pond	Minor Ponds	Hollows	Streams	Wastes	Pipeline
<i>Alliaria petiolata</i> (Garlic Mustard)					6	3	1	
<i>Silene alba</i> (White Campion)					4	4	1	
<i>Malva neglecta</i> (Dwarf Mallow)					1			
<i>Potentilla reptans</i> (Creeping Cinquefoil)				2	1	1	5	1
<i>Epilobium parviflorum</i> (Small-flowered Willowherb) ...	o								1
<i>Oenothera</i> sp. (Evening Primrose)								1
<i>Anthriscus sylvestris</i> (Wild Chervil)					5	1		
<i>Aegopodium podagraria</i> (Goutweed)						1		
<i>Foeniculum vulgare</i> (Fennel)						1		
<i>Heracleum sphondylium</i> (Hogweed)					1	6	1	
<i>Rumex crispus</i> (Curled Dock)								4
<i>R. obtusifolius</i> (Broad-leaved Dock)					1	6	3	5
<i>Urtica dioica</i> (Common Nettle)	r	r	o	2	2	11	5	4
<i>Calystegia sepium</i> (Hedge Bindweed)			la	1	7	1		
<i>Lamium album</i> (White Deadnettle)					3			
<i>Dipsacus fullonum</i> (Wild Teasel)					6			
<i>Tussilago farfara</i> (Coltsfoot)					1		3	
<i>Matricaria matricarioides</i> (Rayless Mayweed)						3	4	
<i>Chrysanthemum parthenium</i> (Feverfew)						1		
<i>Artemisia vulgaris</i> (Mugwort)						1		
<i>Arctium</i> sp. (Burdock)					3	1	1	
<i>Cirsium vulgare</i> (Spear Thistle)						1	4	
<i>C. arvense</i> (Creeping Thistle)		r		3	1	3	4	1
<i>Centaurea nigra</i> (Black Knapweed)					1	1	1	
<i>Lapsana communis</i> (Nipplewort)					1	1	2	1
<i>Lactuca serriola</i> (Prickly Lettuce)								1
<i>Crepis vesicaria</i> ssp. <i>taraxacifolia</i> (Beaked Hawksbeard)							1	
<i>Taraxacum officinale</i> agg. (Dandelion)				1		2	5	3
<i>Dactylis glomerata</i> (Cocksfoot)				1	1		3	

or streams. *Galium aparine* is occasional along the streams of the Common chiefly associated with *Urtica dioica* over which it climbs. By the Beverley Brook on Wimbledon Common it is abundant again with *Urtica dioica* and is flooded every year. *Cerastium glomeratum* recorded in several places along the pipeline is occasional elsewhere on the Common in the wet ruts of woodland tracks.

SUMMARY

1. Ponds and Hollows.

(a) The Hollows Valley

- (i) Originally fish-ponds formed by damming the valley at five points.
- (ii) Two of these ponds are now only marshes and the remaining three are very overgrown.
- (iii) The sequence of dominant plants after the open water community is inferred as *Sparganium erectum*, *Equisetum fluviatile*, *Epilobium hirsutum*, finally degenerating into a mixed marsh and then possibly a community of *Deschampsia cespitosa*.
- (iv) *Salix cinerea* forms lines of trees at successive water levels at the edge of each of the ponds.

(b) Sheepbell Pond

A deeply shaded but permanent pond dominated by *Lemna polyrhiza*, *L. minor* and *Riccia "fluitans" agg.*

TABLE 5
ANNUAL PLANTS OF WASTE PLACES
(None of these species was recorded from U.E. or Sheepbell Ponds)

	I.O.W. Pond	L.E. Pond	Minor Ponds	Hollows	Streams	3 Wastes	1 Pipeline
<i>Papaver rhoeas</i> (Corn Poppy) ...							
<i>Fumaria officinalis</i> agg. (Common Fumitory) ...						2	1
<i>Raphanus raphanistrum</i> (Wild Radish) ...							1
<i>Coronopus squamatus</i> (Swine's Cress) ...						1	1
<i>C. didymus</i> (Wart Cress) ...						1	1
<i>Capsella bursa-pastoris</i> (Shepherd's Purse) ...						7	4
<i>Erysimum cheiranthoides</i> (Treacle Mustard) ...							1
<i>Sisymbrium officinale</i> (Hedge Mustard) ...							2
<i>Cerastium glomeratum</i> (Broad-leaved Mouse-ear Chickweed) ...							4
<i>Stellaria media</i> (Common Chickweed) ...						5	3
<i>Spergula arvensis</i> (Corn Spurrey) ...							5
<i>Chenopodium polyspermum</i> (Many-seeded Goosefoot) ...						1	4
<i>C. album</i> agg. (White Goosefoot) ...						4	5
<i>C. rubrum</i> (Red Goosefoot) ...				1			2
<i>Atriplex patula</i> (Spreading Orache) ...						3	2
<i>A. hastata</i> (Halberd-leaved Orache) ...				2		3	2
<i>Aphanes arvensis</i> agg. (Field Lady's Mantle) ...						2	3
<i>Euphorbia peplus</i> (Petty Spurge) ...						2	
<i>Polygonum aviculare</i> agg. (Knotweed) ...							5
<i>P. persicaria</i> (Common Persicaria) ...	r	r	1	1	1	4	4
<i>P. lapathifolium</i> (Pale Persicaria) ...						1	1
<i>P. convolvulus</i> (Climbing Buckwheat) ...						7	2
<i>Anagallis arvensis</i> (Scarlet Pimpernel) ...						2	1
<i>Solanum nigrum</i> (Black Nightshade) ...						2	1
<i>Chaenorhinum minus</i> (Small Toadflax) ...	r						
<i>Veronica arvensis</i> (Wall Speedwell) ...						1	
<i>V. hederifolia</i> (Ivy-leaved Speedwell) ...				1		2	
<i>V. persica</i> (Buxbaum's Field Speedwell) ...						1	2
<i>Galeopsis tetrahit</i> agg. (Common Hempnettle) ...					1	1	1
<i>Lamium purpureum</i> (Red Deadnettle) ...						2	1
<i>Plantago major</i> (Greater Plantain) ...			1	1	6	3	
<i>Galium aparine</i> (Cleavers) ...			1	2	6	4	2
<i>S. sylvaticus</i> (Heath Groundsel) ...						3	
<i>S. vulgaris</i> (Common Groundsel) ...		r				7	8
<i>Conyza canadensis</i> (Canadian Flea-bane) ...						2	
<i>Tripleurospermum maritimum</i> ssp. <i>inodorum</i> (Scentless Mayweed) ...						4	6
<i>Sonchus oleraceus</i> (Common Sowthistle) ...						4	4
<i>S. asper</i> (Rough Sowthistle) ...			1			2	6
<i>Lolium multiflorum</i> (Italian Rye Grass) ...							1
<i>Poa annua</i> (Annual Meadow Grass) ...						5	3

(c) Minor Ponds

Three of these are ponds for some of the year, seven are only marshes or rarely have any water in them, and four are bomb-craters of which three have permanent water.

2. Streams

The beds are more or less bare of aquatic vegetation but on the banks, and for a few yards on either side, a wasteland community occurs on the earth thrown up in stream clearing.

3. Pipeline

A water-pipeline was laid below ground in September, 1954, right across the Common. The flora establishing itself on the site was chiefly of plants from nearby but there was a fair number of wasteland plants.

4. Wastes

30 small areas of disturbed soil were examined and the waste flora listed.

5. The Plants may be classified as follows:—
 - (a) Aquatics and semi-aquatics.
 - (b) Plants usually associated with standing or flowing water.
 - (c) Plants often associated with standing or flowing water.
 - (d) Perennial and biennial plants of waste places.
 - (e) Annual plants of waste places.
6. Factors involved in dual nature of the Plants.
 - (a) Plants may require standing or flowing water to grow in.
 - (b) Plants may be indifferent to standing or flowing water.
 - (c) Bare mud or soil provided by water or other causes ensures little competition.
 - (d) Seeds or parts of plants may be distributed by water.
 - (e) Plants may have different forms in different habitats.

ACKNOWLEDGMENTS

I am indebted to E. B. Bangerter, C. P. Castell, Mrs. J. F. Hall, P. C. Hall, G. F. Lawrence and many other members of the Bookham team for help in the surveys and to Dr. G. Beven, C. P. Castell and G. F. Lawrence for reading the manuscript and making useful suggestions.

REFERENCES

BANGERTER, E. B., and CASTELL, C. P., 1949, Notes on the Vegetation of Gun-pits and Trenches on Eastern Plain, Bookham Common. *Lond. Nat.*, 28, 51-56.
 —, and —, 1951, Further Notes on the Vegetation of Gun-pits in Eastern Plain, Bookham Common. *Lond. Nat.*, 30, 54.

CASTELL, C. P., 1945, The Ponds and Their Vegetation, *Lond. Nat.*, 24, 15-22.
 —, 1955, The Bomb-Crater Ponds of Bookham Common. *Lond. Nat.*, 34, 16-21.

DANDY, J. E., 1958, *List of British Vascular Plants*. London.

HARVEY, J. H., 1943, Bookham Common: A Short History. *Lond. Nat.*, 22.

RAYNER, J. F., 1927, *A Standard Catalogue of English Names of our Wild Flowers*.

SALISBURY, SIR EDWARD, 1952, *Downs and Dunes*.

SELBY, C. H., 1955, Some Aspects of Dispersal and Succession of Plants in some Epping Forest Ponds. *Lond. Nat.*, 34, 128-141.

Recent Changes in the Bird Population of Grassland with Encroaching Scrub at Bookham Common

By W. D. MELLUISH

This paper is concerned mainly with the changes that have taken place, since 1948, in the bird population of 61 acres of open grassland and scrub known as the Western, Isle of Wight and Bayfield Plains, adjacent to, and west of, the dense oak woods of Bookham Common. The Plains were formerly grazed by cattle and, as recently as in 1948, P. W. E. Currie (1950) was able to write that on the 16th of March of that year the greater part of the plains was burnt to improve the grazing. But in recent years they have been left comparatively undisturbed and there has been a steady increase in the growth of their scrub vegetation, consisting mainly of isolated bushes of hawthorn, dog rose and bramble, with occasional extensive clumps of blackthorn, between which the ground is almost entirely covered by a rank growth of grasses, with *Deschampsia cespitosa* dominant.

The subsoil of the plains is London clay and much of the area is waterlogged in winter, often deeply. A small stream, nowhere much more than a yard in width, flows in a winding course from south-south-east to north-north-west through its shallow valley to water the grasslands, giving rise to an alluvial belt with patches of marshy ground, here and there, along its banks.

To the west, and beyond a belt of tall trees, there is a small sewage farm, with its attendant pastures, a few houses and the fringes of Banks' Common. Northward, over the stream, which here is bordered by dense hedges of blackthorn and hawthorn, lie the rising slopes of permanent pasture. The survey area, which measures approximately 900 yards long and has an average width of 330 yards, rises gently from the level of Bookham Stream to the borders of the oakwood, where it is fringed by extensive patches of bracken. Occasionally the bed of the stream has been thoroughly cleaned and the herbage of its banks cut down, but apart from this and the repair of a culvert now and again, no human interference with the course of natural processes has taken place during the past six years. With the very slight grazing by rabbits and the absence of grazing by cattle the grasses of the ground cover have grown rampantly, encroached on only by the ever increasing advance of the scrub species, of which much the strongest and most abundant is hawthorn. Reference here may be made to the preliminary study of the increase in scrub vegetation of part of Central Plain carried out by C. P. Castell and other members of the Ecology Section in 1951, 1955 (Castell, 1956) and 1959 (*antea* p.64). Figures for comparison between the two years were obtained over four acres, and as the grassland studied is very similar in character to that of the Western, Isle of Wight and Bayfield Plains, being adjacent to the last named, they may be taken as a fair measure of the increase in the number of scrub plants that has occurred throughout the area of the current survey. These counts showed that the number of hawthorn bushes has increased from 93 in 1951 to 415 in 1955 and 609 in 1959. In addition to this study of the number of plants, measurements of the area of ground occupied by hawthorn and rose bushes taken by Castell and others in 1952 and again in 1956 show increases as follows:

- (a) in an area of 12,000 sq. ft., in 1952 9% of the total extent of the ground was covered by hawthorn and rose. This proportion had become 25% by 1956.
- (b) Similar figures in a nearby area of 3,600 sq. ft. were 9% in 1952 and 32% in 1956.

Thus, whether measured by numbers or spread the scrub had increased three or four times between 1951 and 1956, and perhaps six times by 1959.

To some extent the bird population of the plains owes its character to the habitats provided by the surrounding country, the main factors in this being the adjacent oak wood on the eastern edge of the survey area and the sewage farm to the west. There are frequent movements between the open plains and the closed canopy of the wood, in both directions, by such species as great, blue and long-tailed tits, blackbirds, wood pigeons, robins and the woodpeckers. The sewage farm, which possesses a few sprinkler beds as well as an occasional lagoon, attracts chaffinches, magpies, wagtails, blackbirds and song thrushes, among other species.

Sometimes an unusually low count over the plains may be balanced by a large population of birds at the farm, but as the traffic between wood and sewage farm, via the plains, is at times quite noticeably extensive, the presence of the nearby disposal works probably helps to swell both numbers and variety of the local birds, generally.

The Plains have been studied by the Ecology Section at various times since 1943. Some preliminary notes on the birds of Bookham Common as a whole were published in the *London Naturalist* for that year

(Carrington, *et al.*, 1944) and these included maps of song posts of residents and summer migrants. Further work on the breeding species was done over the plains in 1948 under the leadership of P. W. E. Currie, who prepared a series of territory maps from the records obtained and discussed the results of this study at some length in the *L.N.* for the following year (Currie, 1950).

Subsequently, counts were made of birds observed on the Western and Isle of Wight Plains, over an area of 40 acres, by the Section during nine months of 1950, but there are no records for 1951, 1952 and 1953. In the spring of the following year, however, a series of regular visits was commenced and these have continued once a month since then, providing census figures from April, 1954, to March, 1960. They have been undertaken with the objects of:

- (a) providing an account of the species to be found on the plains and the numbers of individuals thereof, and
- (b) determining what changes have taken place in the bird population in recent years and whether such changes may be regarded as a result of first, the observed increase and spread of scrub bushes, which have gradually provided greater cover—thus leaving less open ground between them—and secondly, the rampant growth of coarse grasses, both seeming to be due mainly to the absence of grazing.

METHOD

Monthly counts have been made, usually between 1100 and 1300 hours, the observer walking round the area, as far as possible always using the same route, and mapping the position of all birds seen or heard. Notes were made of singing, breeding activities and feeding and an indication was also made when birds were seen flying over the plains, those at a considerable height being ignored. Particularly in the breeding season the maps were used to record any interesting behaviour and formed the basis from which territory maps of singing males were subsequently constructed. Notes were also made of the state of the weather, height of bracken and grasses and of the abundance or otherwise of the winter berry harvest.

RESULTS

For the purposes of analysis the year has been taken to commence on April 1, the first six months being regarded as "summer," and the second, ending on March 31, as "winter."

(1) VARIETY. Some idea of the variety of the local bird life is given by the following figures, detailing the number of species recorded each year:

TABLE 1
THE NUMBER OF SPECIES RECORDED

40 acres 1950/1 (9 months only)	61 acres					
	1954/5	1955/6	1956/7	1957/8	1958/9	1959/60
For the year						
39	47	49	43	56	49	56
For the summer months	35	36	35	40	43	49
For the winter months	—	34	33	30	33	35

The figures indicate that the number of species inhabiting the plains has tended to increase, if slightly, in recent years.

A greater variety of bird life was recorded in summer than in winter, more species arriving as summer immigrants than as winter visitors, whilst the species of sedentary local residents remained much the same, during each twelve months.

LIST OF SPECIES

Seventy-two species have been observed in the area during the period of the survey. In the following list, where a species may have varying status that which is most characteristic for the area is given, each appearing only under one heading.

Those shown in italics are new to the list of species for the whole of the Common published by L. I. Carrington, C. P. Castell and A. R. Wilton in 1944 (*op. cit.*).

(a) RESIDENT WINTER AND SUMMER (16)

Pheasant	Wren	Hedge Sparrow
Moorhen	Mistle Thrush	Bullfinch
Woodpigeon	Song Thrush	Chaffinch
Magpie	Blackbird	Yellowhammer
Jay	Robin	Reed Bunting
Longtailed Tit		

(b) SPECIES RESIDENT NEARBY, VISITING THE AREA FOR FOOD, SHELTER OR REST (18)

Mallard	Great Tit	Starling
Kestrel	Blue Tit	Hawfinch
Green Woodpecker	Marsh Tit	Greenfinch
Great Spotted Woodpecker	Willow Tit	Goldfinch
Carrion Crow	Meadow Pipit	Redpoll
Jackdaw	Pied Wagtail	House Sparrow

(c) SUMMER VISITORS

(i) BREEDING (8)

Turtledove	Grasshopper Warbler	Willow Warbler
Cuckoo	Whitethroat	Tree Pipit
Nightingale	Lesser Whitethroat	(not after 1957)
(ii) NON-BREEDING OR ON PASSAGE (6)		
Swift	House Martin	Garden Warbler
Swallow	Blackcap	Chiffchaff

(d) WINTER VISITORS (4)

Common Snipe (occasional), Skylark, Redwing, *Fieldfare*

(e) VAGRANTS (SPECIES WITH THREE ENTRIES OR LESS) (20)

Heron	<i>Barn Owl</i>	Nuthatch
<i>Hobby</i>	<i>Tawny Owl</i>	Tree creeper
Partridge	<i>Short-eared Owl</i>	Whinchat
<i>Water Rail</i>	Lesser Spotted	Goldcrest
<i>Jack Snipe</i>	Woodpecker	<i>Waxwing</i>
<i>Woodcock</i>	Rook	Grey Wagtail
Stock dove	Coal Tit	<i>Tree Sparrow</i>

(2) NUMBERS. The numbers of individual birds counted depend on many varying factors, but as the records cover more than eighty visits it is felt that the figures obtained may, perhaps, give a picture of the extent of the local bird life and demonstrate the population trend. Table 2 shows the total number of birds counted in the six-month summer and winter periods. The summer count for 1956 includes those of only five

months, there being no visit to the area in September and no winter figures are shown for 1950 since there was only a November count during the second half of that year, reckoning from April to March.

	40 acres	ACTUAL NUMBER OF BIRDS COUNTED					
		61 acres					
	1950	1954/5	1955/6	1956/7	1957/8	1958/9	1959/60
Summer	304	347	369	313 (5 mnths)	427	456	516
Winter	—	281	315	451	338	773	613

The total numbers of birds observed during the period under review appear to show an increase, both in summer and winter. A few exceptionally large counts should be mentioned as these may possibly give a false impression of the general picture, being only of sporadic occurrence at such magnitude. These were of c. 100 house martins flying, with a few swallows, low over the plains feeding on insects, and included in the total for September, 1955; 225 redwings in December, 1958, and 102 fieldfares in November, 1959. But the immigration of winter thrushes is a regular feature of the bird life of the plains and it seems fair to include such records as they stand. Similarly in spring there is a movement of migrants on passage through the area, only some of whom set up territories and remain to breed. Thus in both winter and summer there may be peaks in numbers and the figures are probably more accurate, for the purpose of demonstrating the trend of the population, if taken as they stand, rather than reduced to allow for exceptional counts when occurring. In comparing the summer total for 1950, when counts over only 40 acres were made, with those of subsequent summers covering the full survey area of 61 acres, allowance should be made for the fact that the added 21 acres (Bayfield Plain) consist almost entirely of coarse, tussocky, grassland with small dotted scrub bushes; and the bird population is sparse. If an estimate for 1950 is made in order to equate the areas it would probably be more correct if taken at about 380 (+25%) than if the count of 304 were multiplied by the acreage ratio of 61 to 40, giving a total of 463, which would undoubtedly overstate the position.

(3) THE SUMMER POPULATION. On all the monthly census field maps, records were made of song and from this information territory maps were constructed for the nine species most characteristic of the area, and for which such maps were obtainable, on the assumption that the presence of a singing male plotted two, three or more times in nearby positions during the breeding season may be taken to indicate a nesting territory. In many cases additional evidence of breeding was obtained. These results can be compared with those of P. W. E. Currie in 1948 and 1949, which are shown in Table 3 below, together with the 1950 records for 40 acres only.

TABLE 3
NUMBERS OF BREEDING TERRITORIES OF NINE SPECIES SPECIALLY STUDIED
(Area = 61 acres, except in 1950)

	1948	1949	1950	1954	1955	1956	1957	1958	1959
	(40 ac.)								
Wren —	4	7	5	4	1	3	3	3	3
Robin —	—	7	6	3	1	4	4	4	3
Whitethroat 12	17	11	8	7	9	8½	8½	12	
Willow Warbler 9½	11	10	7	7	8	16	11	13	
Hedge Sparrow 4	10	5½	3	4	2	3	4	5	
Tree Pipit 6	3	3	1	0	0	(?1)	0	0	
Chaffinch 12	17	10	12	9	10	6	9	8	
Yellowhammer 7	3	5	4	4	5	3	4½	3½	
Reed Bunting 2	1½	1½	1	2	2	4	3	4	

There has been a slight decline in the numbers of breeding pairs of wren, hedge sparrow and yellowhammer. The hedge sparrow appeared in peak numbers in 1949, fell away to only 2 in 1956 but has since been increasing. This species seems to have a liking for wet areas locally and a few can almost always be found on or near the ground surrounding the most marshy part of the Bayfield Plain. The whitethroat declined to 7 pairs in 1955 from the peak of 17 in 1949, but has since partially recovered, with twelve territories in the final year of the survey. Willow warblers have increased a little from the earlier figures, with 13 territories in 1959 as against $9\frac{1}{2}$ in 1948, the highest number (16) occurring in 1957. It is hardly surprising that the tree pipit has been lost, as the coarse grasses which cover almost all of the floor of the plains are too tall and thick for this ground feeding species. There were no breeding records for 1955 and 1956, yet in the following year a bird was observed singing in May and again in June. This was a possible territory, but the evidence was inconclusive and it has to remain as uncertain: there have been no subsequent records. The chaffinch shows a definite decline, having fallen to 8 or 9 territories each summer from 12 at the beginning of the regular survey work and this may be compared with the peak total of 17 in 1948. There appears to be no obvious reason for the smaller numbers of chaffinch pairs on the plains, as there is a superabundance of apparently suitable nesting sites provided by the hawthorn and rose bushes. Robins have also declined from about half a dozen pairs to three or four. A possible explanation here is the reduction in the amount of bare ground between the scrub bushes on which the robin likes to search for food. On the other hand, the reed bunting has increased to about four pairs from the 2, or $1\frac{1}{2}$, territories recorded in earlier years. No doubt the waterlogged marshy parts of the alluvial belt, with their clumps of *Juncus*, provide a favoured habitat for this species.

Miss E. M. Hillman has analysed these breeding figures (unpublished M.S. and also *Progress Report* (1957, *Lond. Nat.*, 36, 51)) up to the summer of 1956, and in order to obtain totals large enough clearly to demonstrate trends she grouped the nine species under three headings based on the feeding habits of the birds concerned. These were:

- (a) Vegetable feeders (Chaffinch, Yellowhammer, Reed Bunting).
- (b) Insectivorous birds feeding on foliage and herbage (Wren, Whitethroat, Willow Warbler).
- (c) Insectivorous ground feeders (Robin, Hedge Sparrow, Tree Pipit).

At this intermediate stage Miss Hillman found that all three groups had declined in numbers of summer territories, the ground feeders (c) suffering most. During the subsequent three summers of 1957/9 the vegetable feeders (a) have not declined further to any extent. Insectivorous species (b) feeding on foliage and herbage have recovered from their low figures of 1955 and 1956, and in 1959 were only slightly less numerous than in 1949. Looking at individual trends it may be noted that the willow warbler is on the increase, as has been mentioned above. Of ground feeders the tree pipit has been lost, but otherwise there has been a partial recovery.

Table 4 shows the number of territories in the three groups, with figures for 1948 and 1949, where available:—

TABLE 4

ANALYSIS OF SUMMER TERRITORIES OF 9 SPECIES GROUPED ACCORDING TO THEIR FEEDING HABITS AS,
SUGGESTED BY MISS E. M. HILLMAN.
(Area = 61 acres, except in 1950.)

	1948	1949	1950 (40 ac.)	1954	1955	1956	1957	1958	1959
(a) <i>Vegetable feeders</i> (Chaffinch, Yellowhammer, Reed Bunting)	21	21½	16½	17	15	16	13	16½	15½
(b) <i>Insectivorous on foliage</i> (Wren, Whitethroat, Willow Warbler)	21½	32	28	20	18	18	27½	22½	28
(c) <i>Insectivorous on ground</i> (Robin, Hedge Sparrow, Tree Pipit)	—	—	15½	10	7	3	8	8	8
Total number of territories in the three groups	—	—	60	47	40	37	48½	47	51½

Thus there has been a decline in the number of breeding territories set up by the nine species from 60 in the 40 acres of the Western and Isle of Wight Plains in 1950 to 51½ over the full survey area of 61 acres in 1959. On the credit side, however, it is pleasant to be able to state that the grasshopper warbler is probably slightly increasing. It has been present on the Common during the breeding season each year from 1948 to 1959. Although not recorded for the survey area in 1950, 1954 and 1955, this was probably because counts were made between 1100 and 1300 hours, a time of day in which the species is inconspicuous. Other breeding species are given in the specific list. In the limited time available it was not possible to study them all in the field, but the figures given in Table 5 below bear out the observer's conclusions that wood pigeon, turtle dove and jay are increasing and that the magpie remains at a fairly constant level. But there are fewer nightingales. For the 1958 and 1959 breeding seasons each have only one record.

Attempts have been made to produce territory maps for the blackbird, but these efforts have not proved successful, possibly because of the change in conspicuousness of this species during the spring and early summer. There is a slight upward trend in numbers.

From 1950 to 1958 one pair of cuckoos worked the plains each summer, but there was no record for 1959.

Table 5. It was not considered practicable to publish a complete statement of all the individual counts made, in view of the space that would be needed to do so, and in Table 5, therefore, those species classed as "vagrants" in the list of species are omitted and the counts have been aggregated into summer and winter totals, each representing six (monthly) visits.

(4) THE WINTER POPULATION. About 10% more birds were found on the plains in the winter than in summer, but the number of species was considerably less, varying from 30 to 36 in comparison with 34 to 39 in summer. Great and blue tits, blackbird and robin were more numerous than in the breeding season, the average counts being:—

		Winter	Summer
Great Tit	..	14	11
Blue Tit	..	35	22
Blackbird	..	56	27
Robin	..	35	21

TABLE 5
THE NUMBERS OF BIRDS OBSERVED. (*Area = 61 acres except in 1950*)

The tits were often in family parties in autumn and no doubt included birds which had bred in the nearby oak woods. Winter numbers of black-birds were about double those of summer and here it is possible that some were immigrants from elsewhere. Wren numbers fell steeply in 1957, but have since recovered and the winter total for 1959/60 was twice that of the first winter of the survey. This apparent recovery and large increase is opposite to the trend shown by summer counts, which (see Table 5) dropped from 36 for Western and Isle of Wight Plains (40 acres) in 1950 to 17 for the full survey area (61 acres) in 1959. Nor do the summer totals for wrens run parallel with breeding figures, which indicate only a slight

fall. Local experience suggests that, like those of the blackbird, wren counts depend very much on their conspicuousness, which varies with weather conditions, or appears to do so. Some reserve is therefore necessary in drawing any conclusions from the bare figures without a more intensive field study being undertaken.

Redwings and fieldfares are regular visitors to the plains, feeding on the berries of hawthorn, rose and blackthorn. On December 13, 1958, there was a count of 225 redwings, the plains being alive with the comings and goings of this attractive thrush, the hawthorn harvest being abundant. By the following month only 41 remained and in February, shortly before their departure, there were 21. High counts of redwings were associated with low ones of fieldfares, and *vice versa*. Presumably this may be due to the measure of the local food supply, which can only support, or attract, a limited number of berry-eating birds. The maximum count of fieldfares was made on November 8, 1959, when there were 102.

(5) THE VAGRANTS. The sporadic appearance of species such as shorteared owl and water rail serve to heighten interest for the observer, engaged month by month in traversing the same ground.

No doubt a closer study, involving frequent visits to the area, particularly at the times of the spring and autumn migrations, would produce further additions to the local list, and it may be that passage birds such as sedge warbler and whinchat, which were each only recorded in the spring of one year, may pass over the plains much more often but are missed because visits are too far apart. The waxwings seen in April, 1959, were part of a group of 18 or 20 which were present in the vicinity for two or three months. A pair of sparrowhawks nest in Central Wood and the species has been seen at the sewage farm. It is probable, therefore, that these birds forage over the plains from time to time, but have not been observed.

SUMMARY OF CONCLUSIONS

(a) With the advance of scrub vegetation across the plains, the number of species of birds found there shows an increase of the order of 15%, and the number of individuals counted on monthly visits has varied from 628 in the first year to 1,129 in the last year of the survey. Chance enters to a considerable extent into the size of the counts, but the results appear to indicate a rising trend in numbers also.

(b) The summer breeding records for nine prominent species show a drop from 60 territories in 40 acres for 1950 to 51½ in 61 acres for 1959. Ground-feeding species have declined more than those seeking their food on herbage and the foliage of trees and bushes.

Slightly decreasing species include whitethroat, wren, hedge sparrow, yellowhammer, cuckoo and nightingale. Considerably declining are robin and chaffinch. The tree pipit has been lost. Increasing species include turtle dove, willow warbler, reed bunting, and probably grasshopper warbler. Magpie, great and blue tits have remained in approximately constant numbers.

(c) In winter, blackbirds, tits and robins are more numerous than in summer. Winter totals of these three species, together with those of the hedge sparrow, have been well maintained, the last named showing a sharp rise in the final year of the survey.

Redwing and fieldfare counts were variable, with maxima of 225 and 102 respectively. The fieldfare does not appear in the list of species for 1943.

(d) The increasing scrub vegetation, with its area of cover and augmented winter berry harvest, attracts more birds to visit the plains for feeding and shelter, and those in greater variety.

However, in summer the number of nesting pairs has been reduced and the rank growth of thick grasses does not provide a habitat which is favourable for ground-feeding species.

(e) The conclusions reached above relate to changes that have taken place between 1948 and early 1960. It must be emphasized that they represent only a temporary phase in the natural history of the area studied. To illustrate this point, and looking further back, it is well known locally that when grazing was prevalent on the plains skylarks abounded, and W. H. Spreadbury (1957) states that they commonly nested there before 1914, usually together with at least one pair of whinchats. Now, the skylark is known only as an occasional winter visitor, and the whinchat merely as a vagrant, passing through on migration.

It is evident that unless action is taken to clear, or thin out, some of the scrub, the plains will gradually revert to climax oak wood and there will be a considerable decline in the number of species of birds inhabiting the common as a whole.

ACKNOWLEDGMENTS

My thanks are due, and are warmly accorded, to all those members of the Ecology Section who, from time to time, have assisted in the field work. I also wish especially to thank Dr. G. Beven, Miss E. M. Hillman and Mr. C. P. Castell, for their welcome advice during the preparation of this paper; Miss Hillman for permission to publish the results of her interim analysis of breeding figures and Mr. Castell for the botanical information to which I have referred in the text.

REFERENCES

CARRINGTON, L. I., CASTELL, C. P., and WILTON, A. R., 1944, Some Preliminary Notes on the Birds of Bookham Common. *Lond. Nat.* for 1943, 23-29.
CASTELL, C. P., 1956, A Preliminary Note on the Increase of Scrub Vegetation (on Bookham Common). *Lond. Nat.*, 35, 9-10.
CURRIE, P. W. E., 1950, Notes on the Summer Resident Birds of the Western Plains. *Lond. Nat.*, 29, 92-7.
SPREADBURY, W. H., 1957, Bookham Common Before 1914 and After. *Lond. Nat.*, 36, 54-7.

A Supplement to the Butterflies and Moths of London and Its Surroundings

By C. G. M. DE WORMS, M.A., Ph.D., F.R.I.C., F.R.E.S.
(Continued from p. 50 of the *London Naturalist*, No. 38 for 1958.)

Part II

NOCTUIDAE

Species originally described in the *London Naturalist* for 1954 (No. 34).

Calocasia coryli Linn. The Nut-tree Tussock. (p. 47). Add B.24.

MIDDLESEX. Ruislip, scarce (Minnion).

KENT. St. Mary Cray, 1956 (Châtelain).

SURREY. Bookham Common, once on May 5, 1952 (Wheeler, *L.N.*, 1954).

BUCKS. Chalfont St. Peter, numerous, including an occasional f. *melanotica* (Ansorge).

Apatele leporina Linn. The Miller. (p. 47). Add B.24.

MIDDLESEX. Ruislip, a few (Minnion); three at Harrow in 1958 (P. Williams); Finchley in 1959 (Keith-Johnston); a few at Mill Hill (Goater).

SURREY. Bookham Common, a few in S.E. area (Wheeler, *L.N.*, 1954).

BUCKS. Chalfont St. Peter in 1958 (Ansorge).

Apatele aceris Linn. The Sycamore. (p. 48).

MIDDLESEX. Finchley, 1959 (Keith-Johnston): Mill Hill, common in 1955 (Goater).

HERTS. Whetstone, 1958 (P. Ward).

KENT. St. Mary Cray (Châtelain).

BUCKS. Chalfont St. Peter (Ansorge).

Apatele megacephala Fabr. The Poplar Grey. (p. 48).

MIDDLESEX. Fairly numerous at Mill Hill (Goater).

SURREY. A remarkable melanic specimen with black fore- and hind-wings taken at Weybridge on July 16, 1955 (Messenger).

BUCKS. Chalfont St. Peter, fairly common (Ansorge).

Apatele alni Linn. The Alder. (p. 49).

MIDDLESEX. Ruislip, rare (Minnion).

SURREY. Wimbledon, once in May, 1956 (Dacie).

Apatele tridens Schiff. The Dark Dagger. (p. 49). Add B.24.

MIDDLESEX. Ruislip, rare (Minnion); an authentic male on July 11, 1955, at Mill Hill (Goater).

BUCKS. A few examples at Chalfont St. Peter (Ansorge).

Cryphia perla Fabr. The Marbled Beauty. (p. 51).

MIDDLESEX. Mill Hill, melanic specimens to the proportion of about 10 per cent taken in 1959 (Goater).

Agrotis corticea Hübn. The Heart and Club. (p. 52).

MIDDLESEX. Ruislip, fairly common (Minnion); Mill Hill, one in 1956 and another in 1958 (Goater).

KENT. Chelsfield, 1950 (A. Swain); St. Mary Cray (Châtelain).

SURREY. Dulwich in 1957 (Canon Edwards, *Ent. Rec.*, 1957).

Agrotis cinerea Hübn. The Light Feathered Rustic. (p. 52).

SURREY. One at Weybridge on May 28, 1956 (Messenger).

KENT. Two males at Farningham on June 23, 1959 (Châtelain).

Agrotis puta Hübn. The Shuttle-shaped Dart. (p. 52). Add B.24.

MIDDLESEX. Mill Hill, many second brood examples in 1959 (Goater).

KENT. St. Mary Cray (Châtelain).

BUCKS. Chalfont St. Peter, common (Ansorge).

Euxoa nigricans Linn. The Garden Dart. (p. 53).

INNER LONDON. Camberwell in 1958 (S. Wakely).

MIDDLESEX. Mill Hill, fairly common, especially in 1957 (Goater).

KENT. St. Mary Cray (Châtelain)

BUCKS. Chalfont St. Peter, scarce (Ansorge).

Euxoa tritici Linn. The White-line Dart. (p. 54).

HERTS. One at Whetstone on July 21, 1959 (P. Ward).

KENT. St. Mary Cray in 1956 and 1957 (Châtelain).

SURREY. Wimbledon in 1957 (Dacie).

Actebia praecox Linn. The Portland Moth. (p. 54). Add (S.17).

SURREY. A specimen taken on a lamp at Wandsworth in 1858 (J. Stevens, *Ent. Weekly Intelligencer*, 5: 115).

Lycophotica varia Vill. The True Lover's Knot. (p. 54).

MIDDLESEX. Mill Hill, one in July, 1955, and another in 1956 (Goater); Ruislip, fairly common (Minnion).

BUCKS. Chalfont St. Peter (Ansorge).

KENT. St. Mary Cray, 1957 (Châtelain).

Peridroma saucia Hübn. The Pearly Underwing. (p. 55). Add B. 24.

MIDDLESEX. Ruislip, rare (Minnion); Mill Hill, scarce (Goater).

KENT. St. Mary Cray, 1957 (Chatelain).

BUCKS. Chalfont St. Peter (Ansorge).

Spaelotis ravida Hübn. The Stout Dart. (p. 55).

MIDDLESEX. Ruislip, once (Minnion); Harrow, one on July 10, 1958 (P. Williams).

HERTS. Two in September, 1959, at Totteridge (Lorimer).

KENT. St. Mary Cray in 1957, one example (Châtelain); one at Pinden on Sept. 1, 1958 (Hare).

Graphiphora augur Fabr. The Double Dart. (p. 55).

MIDDLESEX. Mill Hill, fairly common (Goater); Ruislip, numerous (Minnion).

KENT. Orpington, 1956 (Siggs).

SURREY. Wimbledon, 1958 (Dacie).

BUCKS. Chalfont St. Peter (Ansorge).

Amathes glareosa Esp. The Autumnal Rustic. (p. 56).

SURREY. Wimbledon, 1958 (Dacie).

Amathes castanea Esp. The Grey Rustic. (p. 56).

MIDDLESEX. Ruislip, rare (Minnion).

Amathes ditrapezium Borkh. The Triple-spotted Clay. (p. 57). Add B.24.

SURREY. Wimbledon, 1958 (Dacie); few on Mitcham Common in 1959 (Dillon).

BUCKS. Chalfont St. Peter, rare (Ansorge).

Amathes triangulum Hufn. The Double Square-spot Clay (p. 57).

Add B.24

KENT. St. Mary Cray (Châtelain).

BUCKS. Chalfont St. Peter, (Ansorge).

Amathes stigmatica Hübn. The Square-spotted Clay. (p. 58).

KENT. Orpington, 1957 (Siggs); Westerham, numerous (C. Edwards).

BUCKS. Chalfont St. Peter, scarce (Ansorge).

Amathes sexstrigata Haworth. The Six-striped Rustic. (p. 58). Add B.24.

MIDDLESEX. Hounslow, a few each year (Pierce); Harrow, three in 1958 (P. Williams); Ruislip, common (Minnion).

SURREY. Bookham Common, frequent at headlights (Wheeler, *L.N.*, 1954); a few at Bletchingley in 1958 (Hancock).

BUCKS. Chalfont St. Peter (Ansorge).

Diarsia brunnea Fabr. The Purple Clay. (p. 59). Add B.24.

MIDDLESEX. Mill Hill, once on July 12, 1955 (Goater); Ruislip, scarce (Minnion).

KENT. St. Mary Cray (Châtelain); Abbey Wood, 1954 (Showler, *Ent. Rec.*, 1956).

SURREY. Few at Dulwich, 1959 (Dillon).

BUCKS. Chalfont St. Peter (Ansorge).

Diarsia festiva Schiff. The Engrailed Clay. (p. 59).

MIDDLESEX. Hounslow, once (Pierce); Ruislip, common (Minnion); Finchley, 1959 (Keith-Johnston); Mill Hill, a few each year (Goater).

HERTS. Whetstone, 1959 (P. Ward).

KENT. Orpington, 1955 (Siggs); St. Mary Cray, 1955 (Châtelain).

SURREY. Bookham Common, numerous (Wheeler, *L.N.*, 1954).

Diarsia rubi View. The Small Square-spot. (p. 60).

MIDDLESEX. Mill Hill, some each year (Goater); Ruislip, scarce (Minnion).

KENT. Orpington, 1955 (Siggs); St. Mary Cray (Châtelain).

SURREY. Tadworth, 1959 (Wheeler).

BUCKS. Chalfont St. Peter (Ansorge).

Axylia putris Linn. The Flame. (p. 60). Add B.24.

MIDDLESEX. Ruislip, common (Minnion); Mill Hill (Goater); Finchley, 1959 (Keith-Johnston); Hounslow, common (Pierce).

HERTS. Whetstone, 1959 (P. Ward).

KENT. St. Mary Cray, 1958 (Châtelain).

BUCKS. Chalfont St. Peter (Ansorge).

Triphaena subsequa Hübn. The Lunar Yellow Underwing. (p. 62).

SURREY. Croydon in 1892 (*Proc. Croydon Nat. Hist. Soc.* 4: 1892-3).

Triphaena interjecta Hübn. The Least Yellow Underwing. (p. 63).

Add B.24.

MIDDLESEX. Ruislip, scarce (Minnion); Mill Hill, a few each year (Goater); Finchley, 1959 (Keith-Johnston).

HERTS. Whetstone, 1959 (P. Ward).

KENT. St. Mary Cray, 1957, and two at Eynsford on August 7, 1959 (Châtelain).

BUCKS. Chalfont St. Peter, 1958 (Ansorge).

Triphaena fimbria Linn. The Broad-bordered Yellow Underwing. (p. 63).

MIDDLESEX. Mill Hill, fairly common most years (Goater); Ruislip, numerous (Minnion).

HERTS. Whetstone, 1959 (P. Ward).

BUCKS. Chalfont St. Peter (Ansorge).

Polia tincta Brahm. The Silvery Arches. (p. 64).

SURREY. Taken at Ashtead in 1935 (Greenwood).

Polia nitens Haworth. The Pale Shining Brown. (p. 64). Add M.21.

MIDDLESEX. Ruislip, 1956 (Minnion).

HERTS. Totteridge, three in June, 1958 (Lorimer).

KENT. Orpington, 1956 (Siggs); two at Eynsford on June 22, 1959 (Châtelain).

SURREY. Weybridge, one on July 9, 1955 (Messenger).

BUCKS. Chalfont St. Peter, 1957 (Ansorge).

Polia nebulosa Hufn. The Grey Arches. (p. 64).

MIDDLESEX. Mill Hill, examples rather dark (Goater); four in 1958 at Harrow (P. Williams); Finchley, 1959 (Keith-Johnston).

KENT. Orpington, 1957 (Siggs); St. Mary Cray (Châtelain).

SURREY. Bookham Common, occasionally on trunks (Wheeler, L.N., 1954); Dulwich, common, 1959 (Dillon).

BUCKS. Chalfont St. Peter (Ansorge).

Ceramica pisi Linn. The Broom Moth. (p. 65). Add B.24.

MIDDLESEX. Mill Hill, common (Goater); Ruislip, common (Minnion).

HERTS. Whetstone, 1959 (P. Ward).

KENT. Chelsfield (A. Swain); St. Mary Cray (Châtelain).

SURREY. Bookham Common (Wheeler, L.N., 1954); Dulwich, plentiful, 1959 (Dillon).

BUCKS. Chalfont St. Peter (Ansorge).

Hadena genistae Borkh. The Light Brocade. (p. 66).

MIDDLESEX. Mill Hill, one in June, 1955 (Goater); Ruislip, local (Minnion); Finchley, 1958 (Keith-Johnston); Hounslow, a few (Pierce).

SURREY. Tadworth, 1959 (Wheeler).

BUCKS. Chalfont St. Peter, 1957 (Ansorge).

Hadena suasa Schiff. The Dog's Tooth. (p. 66).

MIDDLESEX. Hampstead (Barratt, 1912).

KENT. St. Mary Cray, 1955 (Châtelain).

SURREY. One at Wimbledon on May 12, 1956 (Dacie); Putney, one at light in June, 1953 (H. Swain).

Hadena thalassina Rott. The Pale-shouldered Brocade. (p. 66).

MIDDLESEX. Mill Hill, one in June, 1955, and another in 1957 (Goater); Ruislip, scarce (Minnion).

KENT. Abbey Wood, 1955 (Showler, Ent. Rec., 1956).

SURREY. Bookham Common, numerous (Wheeler, L.N., 1954).

BUCKS. Chalfont St. Peter (Ansorge).

Hadena contigua Vill. The Beautiful Brocade. (p. 67).

KENT. Two in June, 1956, at Pinden (Hare).

SURREY. Tadworth, 1959 (Wheeler); Putney, one at light in June, 1953 (H. Swain).

Hadena nana Hufn. The Shears. (p. 67).

MIDDLESEX. Ruislip, common (Minnion); Hounslow, once (Pierce).

SURREY. Dulwich, one in 1959 (Dillon).

BUCKS. Chalfont St. Peter (Ansorge).

Hadena conspersa Esp. The Marbled Coronet. (p. 68). Add B.24.

MIDDLESEX. Ruislip, one (Minnion); Mill Hill, one on June 14, 1955 (Goater).

KENT. Orpington, 1957 (Siggs); one there on June 22, 1959 (Châtelain).

SURREY. Wimbledon, one on May 31, 1957 (Dacie).

BUCKS. Chalfont St. Peter, a few in 1957 (Ansorge).

Hadena bicruris Hufn. The Lychnis. (p. 68). Add B.24.

MIDDLESEX. Ruislip, fairly common (Minnion); Mill Hill, a few most years (Goater).

HERTS. Whetstone, 1959 (P. Ward).

KENT. St. Mary Cray (Châtelain).

BUCKS. Chalfont St. Peter (Ansorge).

Hadena cucubali Fuessl. The Campion. (p. 69).

MIDDLESEX. Finchley, 1959 (Keith-Johnston); Mill Hill, a few, 1955-57 (Goater); Ruislip, rare (Minnion).

KENT. St. Mary Cray (Châtelain); Abbey Wood, common (Showler, *Ent. Rec.*, 1956).

SURREY. Wimbledon, 1957 (Dacie); West Norwood in 1959 (Skinner).

Hadena lepida Esp. The Tawny Shears. (p. 69). Add B.24.

MIDDLESEX. Ruislip, once in 1958 (Minnion); Mill Hill, one on June 3, 1959 (Goater).

KENT. Plumstead in 1953 (Showler, *Ent. Rec.*, 1956).

SURREY. Weybridge, one on June 4, 1958 (Messenger); Bookham Common, a few in the southern area (Wheeler, *L.N.*, 1954).

BUCKS. Chalfont St. Peter (Ansorge).

Heliophobus albicolon Hübn. The White Colon. (p. 70). Add K.16.

KENT. Orpington, one in 1958 (Châtelain).

SURREY. One on May 29, 1956 (Messenger).

Heliophobus saponariae Esp. The Bordered Gothic. (p. 70).

KENT. Orpington, 1953 (Siggs); St. Mary Cray, 1958 (Châtelain).

Xylomyges conspicillaris Linn. The Silver Cloud. (p. 71). Add M.21.

MIDDLESEX. One at light at Mill Hill on May 24, 1959 (Goater, *Ent. Gazette*, 1959, 10 : 136).

Tholera popularis Fabr. The Feathered Gothic. (p. 71).

MIDDLESEX. Ruislip, fairly common (Minnion); Mill Hill, four in 1955 (Goater).

KENT. St. Mary Cray, 1955 (Châtelain).

SURREY. Bookham Common, plentiful (Wheeler, *L.N.*, 1954); two at Betchingley in Sept., 1959 (Hancock).

Tholera cespitis Fabr. The Hedge Rustic. (p. 71). Add B.24.

HERTS. Whetstone, 1959 (P. Ward).

KENT. Plumstead, 1953 (Showler, *Ent. Rec.*, 1956).

BUCKS. Chalfont St. Peter, rare (Ansorge).

Cerapteryx graminis Linn. The Antler. (p. 72).

MIDDLESEX. Ruislip, not common (Minnion); Mill Hill, scarce (Goater).

KENT. St. Mary Cray, 1957 (Châtelain).

SURREY. Dulwich, 1957 (Canon Edwards, *Ent. Rec.*, 1957, 219).

Eumichtis adusta Esp. The Dark Brocade. (p. 72).

MIDDLESEX. Hounslow, a few in 1957 (Pierce); Mill Hill, one on June 26, 1955 (Goater).

SURREY. One at Weybridge on July 8, 1958 (Messenger).

BUCKS. Chalfont St. Peter, scarce (Ansorge).

Eumichtis protea Schiff. The Brindled Green. (p. 73).

MIDDLESEX. Ruislip, fairly common (Minnion); Mill Hill, four in 1955, one in 1957 (Goater).

KENT. St. Mary Cray, 1957 (Châtelain).

SURREY. Bookham Common, one on Sept. 2, 1948 (Wheeler, *L.N.*, 1954).

BUCKS. Chalfont St. Peter (Ansorge).

Bombycia viminalis Fabr. The Minor Shoulder-knot. (p. 73). Add B.24.

MIDDLESEX. Ruislip, scarce (Minnion); Mill Hill, one on July 26, 1956 (Goater).

KENT. St. Mary Cray, 1958 (Châtelain).

SURREY. Wimbledon (Dacie); Bookham Common, once at light in July, 1952, also larvae common on sallow (Wheeler, *L.N.*, 1954).

BUCKS. Chalfont St. Peter. (Ansorge).

Eremobia ochroleuca Esp. The Dusky Sallow. (p. 73). Add (I.L.).

INNER LONDON. Hungerford Bridge, one on August 1, 1955 (Sutton).

MIDDLESEX. Ruislip, rare (Minnion).

KENT. Two at Eynsford on August 7, 1959 (Châtelain).

SURREY. Caterham (*Croydon Nat. Hist. Soc. Trans.*, 1883; 167).

Episema caeruleocephala Linn. The Figure of Eight. (p. 74). Add B.24.

MIDDLESEX. Ruislip, fairly common (Minnion); Hampstead (Barratt, 1912).

KENT. Abbey Wood in 1952 (Showler, *Ent. Rec.*, 1956).

BUCKS. Chalfont St. Peter (Ansorge).

Thalpophila matura Hufn. The Straw Underwing. (p. 75).

MIDDLESEX. Ruislip, common (Minnion). Mill Hill, most years (Goater).

KENT. St. Mary Cray (Châtelain).

Procus latruncula Schiff. The Tawny Minor. (p. 76). Add B.24.

MIDDLESEX. Ruislip, rare (Minnion); Mill Hill, recorded each year (Goater); Hounslow, twice (Pierce).

BUCKS. Chalfont St. Peter (Ansorge).

Procus versicolor Borkh. The Rufous Minor. (p. 76). Add B.24.

BUCKS. Chalfont St. Peter, one in 1954 (Ansorge).

Procus fasciuncula Haworth. The Middle-barred Minor. (p. 76).

Add B.24.

MIDDLESEX. Mill Hill, four in 1955 and five in 1957 (Goater); Ruislip, scarce (Minnion); Hounslow, a few (Pierce).

SURREY. Many in 1959 at Dulwich (Dillon) and at West Norwood (Skinner).

BUCKS. Chalfont St. Peter (Ansorge).

Procus literosa Haworth. The Rosy Minor. (p. 76).

MIDDLESEX. Ruislip, very rare (Minnion); Mill Hill, a few most years with a melanic example on August 9, 1958, and another on July 31, 1958 (Goater).

HERTS. Whetstone, one in July, 1959 (P. Ward).

KENT. Orpington, fairly common (Châtelain); Plumstead in 1953 (Showler, *Ent. Rec.*, 1956).

SURREY. Tadworth, 1955 (Wheeler); Wimbledon, one on August 3, 1958 (Dacie).

Procus furuncula Schiff. The Cloaked Minor. (p. 77). Add B.24.

MIDDLESEX. Mill Hill, fairly common most years (Goater); Ruislip (Minnion).

HERTS. Whetstone, August, 1959 (P. Ward).

KENT. Orpington, 1950 (Siggs); Pett's Wood (1950) (A. Swain).

BUCKS. Chalfont St. Peter (Ansorge).

Apamea oblonga Haworth. The Crescent-striped. (p. 77).

KENT. One at Pinden near Dartford on July 23, 1955 (Hare).

Apamea anceps Hübn. The Large Nutmeg. (p. 77).

MIDDLESEX. Mill Hill, fairly numerous (Goater).

KENT. Orpington, 1956 (Siggs); Eynsford and Farningham, June, 1959 (Châtelain).

SURREY. Wimbledon, 1959 (Dacie).

Apamea furva Hübn. The Confused. (p. 78). Add (S.17).

SURREY. Several authentic specimens labelled Banstead Downs, July, 1904 (Meldola: Hope Dept. Collection, Oxford).

Apamea obscura Haworth. The Dusky Brocade. (p. 78).

MIDDLESEX. Ruislip, numerous (Minnion); Mill Hill, fairly common (Goater).

KENT. St. Mary Cray (Châtelain).

Apamea sordens Hufn. The Rustic Shoulder-knot. (p. 78). Add B.24.

BUCKS. Chalfont St. Peter (Ansorge).

Apamea unanimis Hübn. The Small Clouded Brindle. (p. 78).

MIDDLESEX. Mill Hill, a few in 1956 and 1958 (Goater); Ruislip, scarce (Minnion).

HERTS. Whetstone, June, 1959 (P. Ward).

KENT. Orpington, 1956-7 (Siggs).

SURREY. Wimbledon, one on June 18, 1956 (Dacie); also there in 1929 (Greenwood); plentiful at light on Bookham Common (Wheeler, *L.N.*, 1954).

Apamea ophiogramma Esp. The Double-lobed. (p. 79). Add B.24.

MIDDLESEX. Ruislip, local (Minnion); Brent Reservoir, very common and once at Mill Hill on August 6, 1958 (Goater).

KENT. Two at Pinden on July 18, 1956, and July 27, 1957 (Hare); St. Mary Cray, 1956 (Châtelain).

SURREY. Bletchingley, 1958 (Hancock).

BUCKS. Chalfont St. Peter, 1957 (Ansorge).

Apamea crenata Hufn. The Clouded-bordered Brindle. (p. 80). Add B.24.

MIDDLESEX. Ruislip, scarce (Minnion); Mill Hill, a few (Goater).

KENT. Orpington, 1957 (Siggs).

SURREY. West Norwood, common in 1959 (Skinner).

BUCKS. Chalfont St. Peter (Ansorge).

Apamea lithoxylea Esp. The Light Arches. (p. 80). Add B.24.

BUCKS. Chalfont St. Peter, 1956 (Ansorge).

Apamea sublustris Esp. The Reddish Light Arches. (p. 80).

MIDDLESEX. Ruislip area, rare (Minnion).

SURREY. Weybridge, two in 1955 and 1956 (Messenger).

BUCKS. Chalfont St. Peter, once in 1959 (Ansorge).

Apamea hepatica Hübn. The Clouded Brindle. (p. 81).

MIDDLESEX. Ruislip, scarce (Minnion); Mill Hill, fairly common (Goater); Harrow, one in 1958 (P. Williams).

KENT. Orpington, 1957 (Siggs); Pett's Wood, 1947 (A. Swain); St. Mary Cray, 1957 (Châtelain).

SURREY. Bookham Common, once (Wheeler, *L.N.*, 1954); few at West Norwood in 1959 (Skinner).

BUCKS. Chalfont St. Peter (Ansorge).

Apamea scolopacina Esp. The Slender Brindle. (p. 81).

MIDDLESEX. Ruislip district, very rare (Minnion).

HERTS. One at Totteridge in August, 1959 (Lorimer).

KENT. Westerham in 1958 (C. Edwards).

SURREY. One at Oxshott in July, 1959 (de Mornay).

Apamea fissipuncta Haworth. The Dingy Shears. (p. 82). Add B.24.

MIDDLESEX. Ruislip (Minnion); Mill Hill, a few larvae and abundant at Scratch Wood (Goater).

KENT. St. Mary Cray (Châtelain); Pinden, one in 1959 (Hare).

BUCKS. Chalfont St. Peter (Ansorge).

Dypterygia scabriuscula Linn. The Bird's Wing. (p. 82).

MIDDLESEX. Mill Hill, a few in 1956, also at Scratch Wood (Goater); Ruislip, local (Minnion).

HERTS. Whetstone, in 1959 (P. Ward).

KENT. St. Mary Cray, 1953 (Châtelain); Abbey Wood, 1953 (Showler, *Ent. Rec.*, 1956).

SURREY. One at Dulwich in 1959 (Dillon).

Aporophyla lutulenta Borkh. The Deep Brown Dart. (p. 83). Add B.24.

MIDDLESEX. One female at Mill Hill on September 18, 1958 (Goater).

HERTS. A male in Sept., 1956, at Totteridge (Lorimer).

SURREY. A male at Wimbledon on September 4, 1957 (Dacie).

BUCKS. Once at Chalfont St. Peter (Ansorge).

Antitype flavicincta Fabr. The Large Ranunculus. (p. 84).

MIDDLESEX. Ruislip, scarce (Minnion).

KENT. St. Mary Cray, 1957 (Châtelain); one at Abbey Wood in 1951 (Showler, *Ent. Rec.*, 1956).

SURREY. Three at Bletchingley in 1959 (Hancock).

BUCKS. Chalfont St. Peter, a few (Ansorge).

Griposia aprilina Linn. The Merveille-du-jour. (p. 84).

KENT. Pupae dug up at Farnborough and Westerham in 1959 (Châtelain).

SURREY. Bookham Common, larvae common on oak (Wheeler, L.N., 1954).

Brachionycha sphinx Hufn. The Sprawler. (p. 85).

MIDDLESEX. Larvae in May, 1958, at Hounslow (Pierce); Ruislip in 1959 (Minnion).

HERTS. One in October, 1958, at Totteridge (Lorimer).

KENT. Farnborough in 1957 (Châtelain).

BUCKS. Chalfont St. Peter (Ansorge).

Euplexia lucipara Linn. The Small Angle-Shades. (p. 85). Add B.24.

BUCKS. Chalfont St. Peter (Ansorge).

Celaena leucostigma Hübn. The Crescent. (p. 86). Add K.16.

MIDDLESEX. Mill Hill, one on August 19, 1955 (Goater); Ruislip, in 1958 (Minnion); Hounslow in 1957 (Pierce).

HERTS. One in August, 1958, at Totteridge (Lorimer).

KENT. Pinden, one on July 19, 1957 (Hare).

Phalaena typica Linn. The Gothic. (p. 86).

MIDDLESEX. Mill Hill, fairly common (Goater).

HERTS. One in July, 1958, at Whetstone (P. Ward).

KENT. St. Mary Cray (Châtelain).

SURREY. Wimbledon (Dacie).

Hydraecia nictitans Borkh. The Ear Moth. (p. 87).

MIDDLESEX. Mill Hill, a few most years (Goater); Ruislip, scarce (Minnion); Finchley in 1959 (Keith-Johnston).

HERTS. Whetstone in 1959 (P. Ward).

KENT. St. Mary Cray, 1957 (Châtelain).

Hydraecia paludis Tutt. The Saltern Ear. (p. 87). Add H.20, K.16.

MIDDLESEX. Six at Mill Hill, 1955 to 1957 (Goater).

HERTS. Whetstone, one in August, 1959 (P. Ward); two in August, 1958, at Totteridge (Lorimer).

KENT. Common each year recently at Pinden (Hare).

SURREY. Wimbledon in August, 1958 (Dacie).

Hydraecia micacea Esp. The Rosy Rustic. (p. 88). Add B.24.

MIDDLESEX. Mill Hill, common (Goater); Ruislip, numerous (Minnion).

KENT. St. Mary Cray (Châtelain); Abbey Wood (Showler, *Ent. Rec.*, 1956).

SURREY. Dulwich a few in 1959 (Dillon); also at West Norwood (Skinner).

BUCKS. Chalfont St. Peter (Ansorge).

Hydraecia petasitis Doubleday. The Butterbur. (p. 88). Add B.24.

MIDDLESEX. Larvae plentiful near Pinner in 1958 (Goater).

KENT. One in 1959 at Pinden (Hare); one on September 5, 1948, at Westerham (C. Edwards).

BUCKS. One in August, 1958, at Chalfont St. Peter (Ansorge).

Species originally described in the *London Naturalist* for 1955 (No. 35).

Nonagria typhae Thunb. The Bulrush Wainscot. (p. 89). Add B.24.

MIDDLESEX. Mill Hill, four in 1956-57 (Goater); Ruislip, scarce (Minnion).

KENT. Pupae in *Typha latifolia* at Westerham in 1959 (Châtelain).

SURREY. Bookham Common, larvae abundant (Wheeler, *L.N.*, 1954).

BUCKS. Chalfont St. Peter (Ansorge).

Nonagria geminipuncta Haworth. The Twin-spotted Wainscot. (p. 89).

SURREY. One at Weybridge on August 7, 1958 (Messenger).

Nonagria dissoluta Treits. The Brown-veined Wainscot. (p. 90).

N.B. This insect pupates head downwards in the reed stem, not upwards as previously stated.

Chilodes maritima Tausch. The Silky Wainscot. (p. 90).

MIDDLESEX. 54 taken in the Hammersmith Marshes in 1859 (Allchin, *Entom. Weekly Intelligencer*, 8, 203).

Coenobia rufa Haworth. The Small Rufous Wainscot. (p. 90). Add M.21.

MIDDLESEX. Once at Ruislip (Minnion).

SURREY. One on August 6, 1958, at Weybridge (Messenger).

Arenostola fulva Hübn. The Small Wainscot. (p. 91). Add B.24.

MIDDLESEX. Ruislip, scarce (Minnion); Hounslow, two in Sept., 1958 (Pierce).

SURREY. Dulwich, 1957 (Canon Edwards, *Ent. Rec.*, 1957, 69, 219).

BUCKS. Chalfont St. Peter (Ansorge).

Rhizedra lutosa Hübn. The Large Wainscot. (p. 91). Add B.24.

MIDDLESEX. Mill Hill, two in October, 1955, and one in Sept., 1958 (Goater); Ruislip in 1959 (Minnion).

HERTS. Totteridge in 1957 (Lorimer).

KENT. St. Mary Cray, 1957 (Châtelain).

SURREY. Wimbledon in October, 1959 (Dacie); two at Dulwich in 1959 (Dillon); and one at West Norwood (Skinner).

BUCKS. One in 1958 at Chalfont St. Peter (Ansorge).

Leucania favicolor Barrett. Mathew's Wainscot. (p. 92). Add K.16.

KENT. Pinden, three specimens on July 16, 1956, July 10, 1958, and in July, 1959 (Hare).

Leucania straminea Treits. The Southern Wainscot. (p. 93). Add B.24.

BUCKS. Chalfont St. Peter, one in 1959 (Ansorge).

Leucania lithargyria Esp. The Clay (p. 94). Add B.24.

BUCKS. Chalfont St. Peter (Ansorge).

Leucania conigera Esp. The Brown-line Bright-eye. (p. 94). Add B.24.

MIDDLESEX. Common at Mill Hill (Goater); Finchley, 1959 (Keith-Johnston); Ruislip (Minnion).

HERTS. Whetstone, 1959 (P. Ward).

BUCKS. Chalfont St. Peter (Ansorge).

Mythimna turca Linn. The Double-line. (p. 95).

SURREY. One at Wimbledon on June 29, 1957 (Dacie); one in 1959 at Oxshott (de Mornay); Weybridge, one on July 2, 1957 (Messenger).

Meristis trigrammica Hufn. The Treble-lines. (p. 95). Add B.24.

BUCKS. Chalfont St. Peter (Ansorge).

Caradrina alsines Brahm. The Uncertain. (p. 96).

HERTS. Whetstone, 1959 (P. Ward).

KENT. St. Mary Cray, 1957 (Châtelain)

SURREY. Wimbledon (Dacie).

Caradrina taraxaci Hübn. The Rustic. (p. 96). Add B.24.

BUCKS. Chalfont St. Peter (Ansorge).

Caradrina ambigua Fabr. Vine's Rustic. (p. 96).

MIDDLESEX. A few at Hounslow in 1957 (Pierce); Ruislip, a few (Minnion).

SURREY. Several at Wimbledon in Aug., 1957 and in 1958 (Dacie).

Caradrina clavipalpis Scop. The Pale Mottled Willow. (p. 97). Add B.24.

BUCKS. Chalfont St. Peter (Ansorge).

Laphygma exigua Hübn. The Small Mottled Willow. (p. 97).

MIDDLESEX. Mill Hill, one on October 13, 1955 (Goater); Ruislip in 1958 (Minnion).

KENT. Two at Pinden on July 3, 1957, and on August 22, 1958 and two in 1959 (Hare); one at Plumstead in 1953 (Showler, *Ent. Rec.*, 1956).

SURREY. Two at Weybridge, on August 12, 1955, and on September 6, 1957 (Messenger).

Petilampa arcuosa Haworth. The Dotted Buff. (p. 97).

MIDDLESEX. Few at Mill Hill annually; very common at Scratch Wood (Goater).

KENT. St. Mary Cray, 1954 (Châtelain).

BUCKS. Chalfont St. Peter, a few (Ansorge).

Rusina tenebrosa Hübn. The Brown Rustic. (p. 98). Add B.24.

MIDDLESEX. Common at Mill Hill (Goater).

KENT. St. Mary Cray, 1957 (Châtelain).

SURREY. Bookham Common, occasionally (Wheeler, *L.N.*, 1954).

BUCKS. Chalfont St. Peter (Ansorge).

Amphipyra pyramidea Linn. The Copper Underwing. (p. 98).

MIDDLESEX. Mill Hill, a few (Goater).

KENT. Orpington (Siggs); St. Mary Cray (Châtelain).

SURREY. Bookham Common, plentiful (Wheeler, *L.N.*, 1954).

Amphipyra tragopoginis Linn. The Mouse. (p. 98). Add B.24.

SURREY. Bookham Common, several records (Wheeler, *L.N.*, 1954); Betchingley, abundant in 1959 (Hancock).

BUCKS. Chalfont St. Peter (Ansorge).

Gortyna flavago Schiff. The Frosted Orange. (p. 99). Add B.24.

MIDDLESEX. Plentiful at Mill Hill (Goater); Ruislip, scarce (Minnion).

KENT. Orpington, 1957 (Siggs); St. Mary Cray (Châtelain).

SURREY. Bookham Common, larvae common (Wheeler, *L.N.*, 1954).

BUCKS. Common at Chalfont St. Peter (Ansorge).

Dicycla oo Linn. The Heart Moth. (p. 99).

MIDDLESEX. Finchley, one in 1959 (Keith-Johnston); Mill Hill, two females on July 23 and 29, 1955 (Goater); common at Scratch Wood in 1958 (Goater).

SURREY. Three at Oxshott in 1957 (de Mornay).

BUCKS. One at Chalfont St. Peter in 1957 (Ansorge).

Cosmia pyralina View. The Lunar-spotted Pinion. (p. 100).

MIDDLESEX. Three at Mill Hill, on July 26, 1956, July 7, 1957, and on July 21, 1959 (Goater); Ruislip, local (Minnion).

KENT. Farnborough (Châtelain).

SURREY. Dulwich, in 1957 (Canon Edwards, *Ent. Rec.*, 1957, **69**, 219); Oxshott in 1957 (de Mornay); Bookham Common, frequent (Wheeler, *L.N.*, 1954).

BUCKS. Chalfont St. Peter (Ansorge).

Cosmia affinis Linn. The Lesser-spotted Pinion. (p. 100).

INNER LONDON. Camberwell in 1958 (S. Wakely).

MIDDLESEX. Finchley in 1959 (Keith-Johnston); Mill Hill, fairly common (Goater); Ruislip, scarce (Minnion).

KENT. St. Mary Cray (Châtelain).

SURREY. Bletchingley, one on July 29, 1959 (Hancock).

Cosmia diffinis Linn. The White-spotted Pinion. (p. 101).

HERTS. One at Totteridge in August, 1959 (Lorimer).

KENT. Farnborough, 1956 (Châtelain).

Cosmia trapezina Linn. The Dun-bar. (p. 102). Add B.24.

BUCKS. Chalfont St. Peter (Ansorge).

Enargea paleacea Esp. The Angle-striped Sallow. (p. 101). Add (E2.18), (K.16).

ESSEX. Two taken near Woodford about 1897 (Barratt, **5**, 309).

KENT. One taken at Lewisham by Stainton in 1846 (South, ii, 6).

Zenobia retusa Linn. The Double Kidney. (p. 101).

MIDDLESEX. Harrow, one on July 7, 1958 (P. Williams).

SURREY. One at Weybridge, on July 24, 1957 (Messenger); larvae numerous on sallow at Bookham Common (Wheeler, *L.N.*, 1954).

Zenobia subtusa Fabr. The Olive. (p. 102). Add B.24.

MIDDLESEX. Mill Hill, three in August, 1955, also one in 1956 and another in 1957 (Goater).

BUCKS. Once in 1954 at Chalfont St. Peter (Ansorge).

Gypsitea leucographa Hübn. The White-marked. (p. 102).

KENT. Darenth Wood (*Ent. Annual*, 1856, 116).

SURREY. Formerly at Wandsworth (Barrett, **5**, 226).

BUCKS. One at Chalfont St. Peter on May 8, 1959 (Ansorge).

Cerastis rubricosa Fabr. The Red Chestnut. (p. 103). Add B.24.

MIDDLESEX. Three at Mill Hill, on April 30, 1956, April 4, 1957, and on April 22, 1959 (Goater).

KENT. Orpington, 1957 (Châtelain); Abbey Wood, 1951 (Showler, *Ent. Rec.*, 1956).

SURREY. Wimbledon in 1957 (Dacie).

BUCKS. Chalfont St. Peter (Ansorge).

Panolis flammea Schiff. The Pine Beauty. (p. 103).

KENT. Orpington, 1957 (Siggs).

MIDDLESEX. Ruislip, rare (Minnion).

Orthosia miniosa Fabr. The Blossom Underwing. (p. 103).

MIDDLESEX. Mill Hill, one on March 23, 1957 (Goater).

SURREY. Frequent at sallow blossom on Bookham Common (Wheeler *L.N.*, 1954).

Orthosia populeti Treits. The Lead-coloured Drab. (p. 104).

SURREY. Bookham Common, larvae common on aspen (Wheeler, *L.N.*, 1954).

Orthosia munda Esp. The Twin-spotted Quaker. (p. 105).

MIDDLESEX. Twice at Mill Hill, on March 28, 1957, and April 2, 1959 (Goater).

KENT. Orpington, 1957 (Siggs).

SURREY. Common on sallow bloom at Bookham Common (Wheeler, *L.N.*, 1954).

BUCKS. Chalfont St. Peter (Ansorge).

Orthosia advena Schiff. The Northern Drab. (p. 105). Add B.24.

SURREY. Wimbledon in 1958 (Dacie).

BUCKS. Rare at Chalfont St. Peter (Ansorge).

Orthosia gracilis Fabr. The Powdered Quaker. (p. 106).

MIDDLESEX. Mill Hill, fairly common most years (Goater).

HERTS. Whetstone in 1959 (P. Ward).

KENT. St. Mary Cray, 1957 (Châtelain).

SURREY. Frequent at Bookham Common (Wheeler, *L.N.*, 1954); one in March, 1959, at Bletchingley (Hancock); West Norwood, 1959 (Skinner).

BUCKS. Chalfont St. Peter (Ansorge).

Atethmia xerampelina Hübn. The Centre-barred Sallow. (p. 106).

Add B.24.

MIDDLESEX. Mill Hill, eight in 1955 and one in 1957 (Goater); Ruislip, rare (Minnion).

KENT. St. Mary Cray, 1957 (Châtelain).

SURREY. Wimbledon, September 1957 (Dacie); Bookham Common, numerous (Wheeler, *L.N.*, 1954).

BUCKS. Chalfont St. Peter in 1958 (Ansorge).

Omphaloscelis lunosa Haworth. The Lunar Underwing. (p. 107).

Add B.24.

BUCKS. Chalfont St. Peter (Ansorge).

Parastichtis suspecta Hübn. The Suspected. (p. 107). Add B.24.

KENT. Pett's Wood, 1953 (Siggs).

SURREY. Bookham Common, one on August 10, 1951 (Wheeler, *L.N.*, 1954).

BUCKS. Chalfont St. Peter, scarce (Ansorge).

Agrochola lota Clerck. The Red-line Quaker. (p. 107). Add B.24.

MIDDLESEX. Mill Hill, once on October 13, 1956 (Goater); Ruislip, common (Minnion).

KENT. Orpington, 1957 (Châtelain).

BUCKS. Chalfont St. Peter (Ansorge).

Agrochola macilenta Hübn. The Yellow-line Quaker. (p. 107). Add B.24.

KENT. Orpington (Châtelain).

SURREY. Oxshott, 1957 (de Mornay).

BUCKS. Chalfont St. Peter (Ansorge).

Agrochola circellaris Hufn. The Brick. (p. 108). Add B.24.

BUCKS. Chalfont St. Peter (Ansorge).

Anchoscelis helvola Linn. The Flounced Chestnut. (p. 108). Add B.24.
 MIDDLESEX. Ruislip, scarce (Minnion).
 KENT. Orpington, 1956 (Siggs); St. Mary Cray (Châtelain); Abbey Wood, scarce (Showler, *Ent. Rec.*, 1956).
 SURREY. Oxshott, 1957 (de Mornay).
 BUCKS. Chalfont St. Peter (Ansorge).

Anchoscelis litura Linn. The Brown-spot Pinion. (p. 109).
 MIDDLESEX. Mill Hill, a few each year (Goater).

KENT. St. Mary Cray, 1956 (Châtelain); Abbey Wood, common (Showler, *Ent. Rec.*, 1956).

Tiliacea citrago Linn. The Orange Sallow. (p. 109). Add B.24.
 KENT. St. Mary Cray, 1957 (Châtelain).
 SURREY. Wimbledon, 1957 (Dacie); Dulwich, 1958 (Dillon).
 BUCKS. Chalfont St. Peter (Ansorge).

Tiliacea aurago Fabr. The Barred Sallow. (p. 109).
 KENT. St. Mary Cray, 1957 (Châtelain).
 SURREY. Wimbledon, 1959 (Dacie).
 BUCKS. Chalfont St. Peter (Ansorge).

Cirrhia icteritia Hufn. The Common Sallow. (p. 110). Add B.24.
 BUCKS. Chalfont St. Peter (Ansorge).

Cirrhia lutea Stroem. The Pink-barred Sallow. (p. 110). Add B.24.
 KENT. Orpington, 1956 (Siggs).
 BUCKS. Chalfont St. Peter (Ansorge).

Cirrhia gilvago Esp. The Dusky-lemon Sallow (p. 110).
 MIDDLESEX. Two at Mill Hill, on October 8, 1956, and on October 3, 1957 (Goater); once at Hounslow (Pierce).
 KENT. Farnborough (Châtelain).
 SURREY. Wimbledon, 1958 (Dacie); Putney in 1954 (H. Swain); two at Weybridge, 1955-56 (Messenger).

Cirrhia ocellaris Borkh. The Pale-lemon Sallow. (p. 111).
 SURREY. Weybridge, one on September 24, 1956 (Messenger); many larvae from poplar in that area in 1957 and 1958 (C. de W.).

Conistra vaccinii Linn. The Common Chestnut. (p. 112). Add B.24.
 BUCKS. Chalfont St. Peter (Ansorge).

Conistra ligula Fabr. The Dark Chestnut. (p. 172). Add B.24.
 MIDDLESEX. Four at Mill Hill, 1955-58 (Goater).
 KENT. Orpington and St. Mary Cray (Châtelain).
 SURREY. Bookham Common, frequent (Wheeler, *L.N.*, 1954).
 BUCKS. Chalfont Stl Peter (Ansorge).

Eupsilia transversa Hufn. The Satellite. (p. 113). Add B.24.
 SURREY. Bookham Common, numerous (Wheeler, *L.N.*, 1954).
 BUCKS. Chalfont St. Peter (Ansorge).

Lithophane semibrunnea Haworth. The Tawny Pinion. (p. 113).
 KENT. One at Westerham on May 11, 1958 (C. Edwards).

Lithomoia solidaginis Hübn. The Golden-rod Brindle. (p. 114).
 Add (K.16).
 KENT. One at rest near Abbey Wood on August 28, 1954 (Showler, *Ent. Rec.*, 1954, 66, 273).

Xylocampa areola Linn. The Early Grey. (p. 114).

SURREY. Bookham Common, numerous (Wheeler, *L.N.*, 1954).

Cucullia verbasci Linn. The Mullein Shark. (p. 115). Add B.24.

BUCKS. Chalfont St. Peter in May, 1959 (Ansorge).

Cucullia umbratica Linn. The Common Shark. (p. 116).

MIDDLESEX. Mill Hill, three in July, 1958 (Goater).

KENT. St. Mary Cray (Châtelain); Abbey Wood, fairly common (Showler, *Ent. Rec.*, 1956).

Cucullia chamomillae Schiff. The Chamomile Shark. (p. 116).

MIDDLESEX. Ruislip, scarce (Minnion).

KENT. Orpington, 1954 (Siggs); Abbey Wood, 1954 (Showler, *Ent. Rec.*, 1956).

SURREY. One at Wimbledon on April 25, 1960 (Dacie).

Cucullia asteris Schiff. The Starwort Shark. (p. 116).

KENT. Orpington, 1948 (Siggs).

Cucullia absinthii Linn. The Wormwood Shark. (p. 117).

MIDDLESEX. Two at Harrow in 1958 (P. Williams); Finchley, 1959 (Keith-Johnston); Mill Hill, two in July, 1955, also larvae common at Brent Reservoir (Goater).

KENT. Orpington, 1956 (Châtelain); Pinden, two in 1956 and one on July 24, 1957 (Hare); Abbey Wood, 1953-54 (Showler, *Ent. Rec.*, 1956).

SURREY. Wimbledon, one on July 6, 1959 (Dacie); Dulwich in 1958 (Dillon); Tadworth, 1957 (Wheeler); Weybridge, one each year, 1956-58 (Messenger); larvae at Epsom in Sept., 1956 (Finnigan, *Ent. Rec.*, 1956, 68, 282).

Cucullia gnaphalii Hübn. The Cudweed Shark. (p. 117). Add E2.18.

ESSEX. Barrett (6, 80) mentions its occurrence in Epping Forest.

Anarta myrtilli Linn. The Beautiful Yellow Underwing. (p. 117).

SURREY. Bookham Common, plentiful (Wheeler, *L.N.*, 1954).

Panemeria tenebrata Scop. The Small Yellow Underwing. (p. 118).

SURREY. Bookham Common, once on May 24, 1953 (Wheeler, *L.N.*, 1954).

MIDDLESEX. Ruislip, scarce (Minnion).

Pyrrhia umbra Hufn. The Bordered Sallow. (p. 118). Add B.24.

MIDDLESEX. Ruislip, rare (Minnion); Mill Hill, one on July 4, 1957 (Goater).

KENT. Orpington, 1955 and 1956 (Châtelain).

SURREY. Wimbledon, 1959 (Dacie); Oxshott, 1959 (de Mornay).

BUCKS. Chalfont St. Peter, one each year, 1955, 1957, 1958 (Ansorge).

Heliothis peltigera Schiff. The Bordered Straw. (p. 119). Add H.20.

HERTS. One at Totteridge in March, 1957 (Lorimer); one at Arkley on June 10, 1958 (Howarth).

KENT. Two at Westerham, on July 28, 1946, and June 11, 1958 (C. Edwards); one at Plumstead in 1953 (Showler, *Ent. Rec.*, 1956).

SURREY. Weybridge, one on July 3, 1957 (Messenger).

Heliothis armigera Hübn. The Scarce Bordered Straw. (p. 120).

MIDDLESEX. One at Kingsbury on August 10, 1958 (A. Myers, *Ent. Rec.*, 1958, 70, 274).

KENT. Westerham, one on September 4, 1958 (C. Edwards); one at Otford on September 30, 1959 (W. Manley).

Acontia luctuosa Esp. The Four Spotted. (p. 120).

KENT. St. Mary Cray, 1958 (Châtelain).

SURREY. Weybridge, two on July 3, 1957, and July 15, 1958 (Messenger). (*Acontia catena* Sowerby) (I.L.)

An example of this North American species was taken in Brixton in September, 1793 and became known as the Brixton Beauty (*vide* Barrett, 6, 180).

Eublemma parva Hübn. The Small Marbled. (p. 120). Add (K. 16).

KENT. One at Otford on July 21, 1959 (W. Manley).

Jaspidia pygarga Hufn. The Marbled White-spot. (p. 121). Add B.24.

MIDDLESEX. Ruislip, fairly common (Minnion).

KENT. Orpington, 1954 (Siggs); St. Mary Cray, 1957 (Châtelain).

SURREY. Bookham Common, numerous (Wheeler, *L.N.*, 1954); Oxshott, 1957 (de Mornay).

BUCKS. Chalfont St. Peter (Ansorge).

Eustrotia uncula Clerck. The Silver Hook. (p. 121).

SURREY. Bookham Common, several records (Wheeler, *L.N.*, 1954); one at Weybridge on July 15, 1956 (Messenger).

Hapalotis venustula Hübn. The Rosy Marbled. (p. 121). Add K.16.

KENT. Westerham, one in June, 1937 (C. Edwards).

SURREY. Two at Weybridge, one July 3, 1956, and on July 2, 1958 (Messenger).

Rivula sericealis Scop. The Straw Dot. (p. 121). Add B.24.

MIDDLESEX. Finchley, 1959 (Keith-Johnston); one in Syon Park near Hounslow (Pierce); Ruislip, common (Minnion).

KENT. Abbey Wood, numerous (Showler, *Ent. Rec.*, 1956).

SURREY. Bookham Common, plentiful (Wheeler, *L.N.*, 1954); Oxshott, 1959 (de Mornay); two at Putney in 1952 and 1953 (H. Swain)

BUCKS. One at Chalfont St. Peter in 1958 (Ansorge).

Phytometra viridaria Clerck. The Small Purple-barred. (p. 121).

SURREY. Headley, 1956, and Bookham Common 1958 (Wheeler, *L.N.*, 1954); Dulwich, 1958 (Dillon).

Emmelia trabealis Scop. The Spotted-sulphur. (p. 122). Add (S.17).

SURREY. One taken at light in 1858 in Dulwich by C. G. Barrett (*vide* Barrett, 6, 191).

Scoliopteryx libatrix Linn. The Herald. (p. 122). Add B.24.

BUCKS. Chalfont St. Peter (Ansorge).

Plusia moneta Fabr. The Golden Plusia. (p. 122). Add B.24.

MIDDLESEX. Mill Hill, fairly common (Goater).

KENT. St. Mary Cray (Châtelain).

BUCKS. Chalfont St. Peter (Ansorge).

Plusia chrysitis Linn. The Burnished Brass. (p. 123). Add B.24.

SURREY. Bookham Common, numerous (Wheeler, *L.N.*, 1954).

BUCKS. Chalfont St. Peter (Ansorge).

Plusia bractea Fabr. (H.20).

This handsome member of the Plusias, the Gold Spangle, is mainly an inhabitant of the northerly parts of the British Isles, such as Scotland and some of the northern English Counties, as well as most of Ireland. In recent years it seems to have been extending its range southwards so

that it is hardly surprising that a specimen was taken in the Area in HERTS at Totteridge on July 22, 1957, by R. Lorimer (*vide Ent. Gazette*, 1958, 9, 20).

Plusia festucae Linn. The Gold Spot. (p. 123). Add B.24.

MIDDLESEX. Mill Hill, one on September 19, 1955 (Goater); Ruislip, rare (Minnion); Hampstead (Barratt, 1912).

BUCKS. Chalfont St. Peter in 1959 (Ansorge).

Plusia iota Linn. The Plain Golden Y. (p. 123). Add B.24.

MIDDLESEX. Mill Hill, three 1957-58 (Goater).

HERTS. Whetstone, 1958 (P. Ward).

KENT. St. Mary Cray (Châtelain).

SURREY. Wimbledon, 1958 (Dacie); Weybridge, two on July 3, 1957, and on July 15, 1958 (Messenger).

BUCKS. Chalfont St. Peter (Ansorge).

Plusia pulchrina Haworth. The Beautiful Golden Y. (p. 124). Add B.24.

MIDDLESEX. Mill Hill, a few most years (Goater); Finchley, 1959 (Keith-Johnston); Hampstead (Barratt, 1912).

KENT. Orpington, and St. Mary Cray (Châtelain).

BUCKS. Chalfont St. Peter (Ansorge).

Plusia ni Hübn. The Ni Moth. (p. 124). Add (M.21), (K.16).

MIDDLESEX. Ruislip area, one in 1958 (Minnion).

KENT. Westerham, one on July 18, 1958 (C. Edwards).

Abrostola triplasia Linn. The Dark Spectacle. (p. 125). Add B.24.

MIDDLESEX. Hounslow, 1958 (Pierce).

BUCKS. Chalfont St. Peter (Ansorge).

Abrostola tripartita Hufn. The Light Spectacle. (p. 125). Add B.24.

MIDDLESEX. Mill Hill, fairly common (Goater); Hounslow (Pierce).

SURREY. Wimbledon, 1958 (Dacie); Oxshott, 1957 (de Mornay); Betchingley, one at light in July, 1959 (Hancock).

BUCKS. Chalfont St. Peter (Ansorge).

Euclidimera mi Clerck. The Mother Shipton. (p. 126). Add B.24.

SURREY. Bookham Common, abundant (Wheeler, *L.N.*, 1954).

KENT. Farnborough (Châtelain).

BUCKS. Chalfont St. Peter (Ansorge).

Ectypa glyphica Linn. The Burnet Companion. (p. 126). Add B.24.

MIDDLESEX. Ruislip, local (Minnion); Hounslow, a few (Pierce).

SURREY. Bookham Common, abundant (Wheeler, *L.N.*, 1954).

BUCKS. Chalfont St. Peter, common (Ansorge).

Lygephila pastinum Treits. The Blackneck. (p. 128).

KENT. Orpington, 1957 and one at Eynsford on August 7, 1959 (Châtelain).

SURREY. Wimbledon, 1959 (Dacie); Bookham Common, occasional (Wheeler, *L.N.*, 1954).

Catocala sponsa Linn. The Dark Crimson Underwing. (p. 127).

KENT. Barrett (6, 262) mentions it was formerly found at West Wickham, Shooter's Hill and Darenth Wood.

SURREY. Formerly in Richmond Park and Leatherhead (Barrett, 6, 262).

Catocala promissa Esp. The Light Crimson Underwing. (p. 128).
Add (K.16), (S.17).

KENT. Formerly at West Wickham (Barrett, 6, 267).

SURREY. Reported from Leatherhead (Barrett, 6, 267).

Laspeyria flexula Schiff. The Beautiful Hook-tip. (p. 128).

MIDDLESEX. Mill Hill, one on July 7, 1957 (Goater).

KENT. One at Pinden on July 4, 1957 (Hare).

SURREY. Bookham Common, a few larvae (Wheeler, L.N., 1954); one at Putney in July, 1953 (H. Swain); Dulwich, a few in 1959 (Dillon).

BUCKS. Chalfont St. Peter, 1959 (Ansorge).

Parascotia fuliginaria Linn. The Waved Black. (p. 129). Add H.20.

MIDDLESEX. One on July 29, 1957, at Feltham (Classey); one taken by Mr. M. Britton at m.v. light at Ruislip on August 10, 1956 (Minnion, Ent. Gazette, 1957, 8, 244).

HERTS. One on August 4, and another on August 15, 1954, at Arkley (vide Ent. Gazette, 1954, 5: 232); one also taken there in 1957 (Howarth).

SURREY. Weybridge, three 1956-1958 (Messenger); Oxshott, several 1957-1959 (de Mornay).

Zanclognatha tarsipennalis Treits. The Brown Fanfoot. (p. 129).

Add B.24.

MIDDLESEX. Mill Hill, fairly common (Goater).

KENT. Orpington and St. Mary Cray, 1957 (Châtelain).

BUCKS. Chalfont St. Peter (Ansorge).

Zanclognatha grisealis Hübn. The Small Fanfoot. (p. 129). Add B.24.

MIDDLESEX. Mill Hill, fairly common (Goater); Hounslow (Pierce).

HERTS. Whetstone, 1959 (P. Ward).

KENT. Orpington, 1954, and St. Mary Cray (Châtelain).

SURREY. Bookham Common, frequent (Wheeler, L.N., 1954)

BUCKS. Chalfont St. Peter (Ansorge).

Paracolax derivalis Hübn. The Clay Fanfoot. (p. 130). Add (E2.18).

ESSEX. Formerly in Epping Forest (Ent. Annual, 1861: 101).

KENT. At one time taken at Bexley, Woolwich and Darenth (Barrett, 6, 291)..

Herminia barbalis Clerck. The Common Fanfoot. (p. 130).

MIDDLESEX. Ruislip, rare (Minnion).

KENT. Abbey Wood, 1952 (Showler, Ent. Rec., 1956).

SURREY. Bookham Common (Wheeler, L.N., 1954); Dulwich, one, July 10, 1957 (Canon Edwards, Ent. Rec., 1957, 69, 219).

Hypena proboscidalis Linn. The Common Snout. (p. 131). Add B.24.

BUCKS. Chalfont St. Peter (Ansorge).

Hypena rostralis Linn. The Buttoned Snout. (p. 131).

MIDDLESEX. Two in 1957-58 at Mill Hill (Goater); Ruislip, rare (Minnion).

KENT. Abbey Wood, 1952 (Showler, Ent. Rec., 1956).

Tholomiges turfosalis Wocke. The Marsh Oblique-barred. (p. 132).

SURREY. Weybridge, one in 1958 (Messenger); two near the Black Pond at Esher on August 31, 1955 (A. Allen, Ent. Rec., 1958, 70, 85). Dulwich on July 10, 1957 (Canon Edwards, Ent. Rec., 1957, 69, 219).

GEOMETRIDAE

Species originally described in the *London Naturalist* for 1956 (No. 36).

Brephos parthenias Linn. The Orange Underwing. (p. 133).

SURREY. Headley, 1959 (Wheeler).

KENT. Upper Belvedere (Showler, *Ent. Rec.*, 1956).

Pseudoterpnia pruinata Hufn. The Grass Emerald. (p. 134). Add B.24.

MIDDLESEX. Mill Hill, two on July 26, 1956, and July 19, 1957 (Goater).

SURREY. Bookham Common, larvae numerous on petty whin (Wheeler, *L.N.*, 1954).

KENT. Larvae common on broom at Dartford in 1959 (Châtelain).

BUCKS. Chalfont St. Peter (Ansorge).

Hipparchus papilionaria Linn. The Large Emerald. (p. 135).

MIDDLESEX. Mill Hill, one on July 17, 1958.

KENT. Abbey Wood, common (Showler, *Ent. Rec.*, 1956).

SURREY. Bookham Common, one on June 20, 1949 (Wheeler, *L.N.*, 1954).

Hemistola immaculata Thunb. The Small Emerald. (p. 135). Add B.24.

KENT. St. Mary Cray, 1957 (Châtelain).

BUCKS. Chalfont St. Peter (Ansorge).

Comibaena pustulata Hufn. The Blotched Emerald. (p. 136).

SURREY. Bookham Common, larvae beaten occasionally (Wheeler, *L.N.*, 1954).

BUCKS. Chalfont St. Peter (Ansorge).

Iodis lactearia Linn. The Little Emerald. (p. 136). Add B.24.

SURREY. Bookham Common, numerous (Wheeler, *L.N.*, 1954).

KENT. Abbey Wood, fairly common (Showler, *Ent. Rec.*, 1956).

BUCKS. Chalfont St. Peter (Ansorge).

Hemithea aestivaria Hübn. The Common Emerald. (p. 137). Add B.24.

SURREY. Bookham Common, plentiful (Wheeler, *L.N.*, 1954).

BUCKS. Chalfont St. Peter (Ansorge).

Sterrhia rusticata Fabr. The Least Carpet. (p. 137). Add S.17.

KENT. St. Mary Cray, 1957 (Châtelain); Charlton, 1958 (Showler).

SURREY. Dulwich in July, 1957 (Canon Edwards, *Ent. Rec.*, 1957, 219).

Sterrhia fuscovenosa Goeze. The Dwarf Cream Wave. (p. 138).

HERTS. Whetstone, 1959 (P. Ward).

KENT. St. Mary Cray (Châtelain); two at Belvedere (Showler, *Ent. Rec.*, 1956).

BUCKS. Chalfont St. Peter (Ansorge).

Sterrhia subsericeata Haworth. The Satin Wave. (p. 138). Add B.24.

SURREY. Bookham Common, frequent at light (Wheeler, *L.N.*, 1954).

BUCKS. Chalfont St. Peter, one in 1958 (Ansorge).

Sterrhia inornata Haworth. The Plain Wave. (p. 139). Add B.24.

HERTS. Whetstone in 1959 (P. Ward).

BUCKS. Chalfont St. Peter in 1959 (Ansorge).

Sterrhia biselata Hufn. The Small Fan-footed Wave. (p. 139).

KENT. Pett's Wood, 1950 (A. Swain).

SURREY. Bookham Common, plentiful at light (Wheeler, *L.N.*, 1954).

BUCKS. Chalfont St. Peter (Ansorge).

Sterrha trigeminata Haworth. The Treble Brown-spot Wave (p. 140).
KENT. St. Mary Cray (Châtelain).

SURREY. Wimbledon, 1957 (Dacie); Bookham Common, numerous (Wheeler, *L.N.*, 1954).

Sterrha emarginata Linn. The Small Scallop. (p. 140). Add B.24.

SURREY. Bookham Common, frequent at light (Wheeler, *L.N.*, 1954).

BUCKS. One at Chalfont St. Peter in 1954 and another there in 1956 (Ansorge).

Scopula ornata Scop. The Lace Border. (p. 141).

SURREY. Abundant on the downs near Betchingley in August, 1959 (Hancock).

Scopula floslactata Haworth. The Cream Wave. (p. 141). Add B.24.

SURREY. Bookham Common, numerous (Wheeler, *L.N.*, 1954).

BUCKS. Chalfont St. Peter (Ansorge).

Scopula immutata Linn. The Lesser Cream Wave. (p. 141).

SURREY. Bookham Common, one on July 8, 1945, and another on July 7, 1947 (Wheeler, *L.N.*, 1954).

Scopula marginepunctata Goeze. The Mullein Wave. (p. 142). Add I.L.

INNER LONDON. One in 1958 at Camberwell (S. Wakely).

MIDDLESEX. Hounslow, once (Pierce); Finchley, one in 1959 (Keith-Johnston).

SURREY. Wandsworth, two on August 28 and September 5, 1955 (Sutton); Wimbledon, one in Sept., 1959 (Dacie); Dulwich in July, 1957 (Canon Edwards, *Ent. Rec.*, 1957, 69, 219).

Scopula imitaria Hübn. The Small Blood-vein. (p. 142).

KENT. St. Mary Cray, 1955 (Châtelain).

SURREY. Oxshott, 1958 (de Mornay).

BUCKS. Chalfont St. Peter (Ansorge).

Calothysanis amata Linn. The Blood-vein. (p. 143).

KENT. A melanic example, ab. *pulverata* Cockayne, taken at Pinden on July 13, 1947 (Hare).

Cosymbia punctaria Linn. The Maiden's Blush. (p. 143).

HERTS. Whetstone, 1958 (P. Ward).

KENT. St. Mary Cray, 1956 (Châtelain).

SURREY. Oxshott, 1957 (de Mornay); Bookham Common, fairly common (Wheeler, *L.N.*, 1954).

Cosymbia pupillaria Hübn. Blair's Mocha. (p. 144). Add M.21, S.17, B.24.

MIDDLESEX. One at Kingsbury on October 12, 1959 (Myers).

SURREY. One at Wimbledon on October 16, 1959 (Dacie, *Ent. Rec.*, 1960, 72, 22).

BUCKS. Female at light, f. *badiaria* Staudinger, at Chalfont St. Peter on September 25, 1957 (Ansorge, *vide Ent. Gazette*, 1958, 9, 44).

Cosymbia linearia Hübn. The Clay Triple-lines. (p. 144).

MIDDLESEX. Ruislip, 1958 (Minnion).

SURREY. Wimbledon, one on June 7, 1959 (Dacie).

Cosymbia albipunctata Hufn. The Birch Mocha. (p. 145).

BUCKS. Chalfont St. Peter, one in 1958 (Ansorge).

KENT. St. Mary Cray (Châtelain).

Anaitis plagiata Linn. The Treble-bar. (p. 1-45). Add B.24.

SURREY. Box Hill, 1946 (Fletcher); Oxshott, 1958 (de Mornay).

BUCKS. Chalfont St. Peter (Ansorge).

Anaitis efformata Guenée. The Lesser Treble-bar. (p. 146). Add B.24.

MIDDLESEX. Mill Hill, three in 1956-57.

HERTS. Whetstone, in August, 1958 (P. Ward).

SURREY. Wimbledon, one on August 10, 1957 (Dacie); Putney, one in May, 1953 (H. Swain).

BUCKS. Chalfont St. Peter, rare (Ansorge).

Chesias legatella Schiff. The Streak. (p. 146). Add B.24.

KENT. St. Mary Cray, 1957 (Châtelain).

BUCKS. Chalfont St. Peter (Ansorge).

Chesias rufata Fabr. The Broom-tip. (p. 146).

SURREY. Wimbledon in 1957 (Dacie).

Nothopteryx carpinata Borkh. The Early Tooth-striped. (p. 147). Add B.24.

SURREY. Bookham Common, frequent (Wheeler, *L.N.*, 1954); Wimbledon, 1930 (Greenwood).

BUCKS. Chalfont St. Peter, one in 1957 (Ansorge).

Acasis viretata Hübn. The Yellow-barred Brindle. (p. 148). Add B.24.

MIDDLESEX. One in Syon Park, Brentford (Pierce).

SURREY. Oxshott in 1957 (de Mornay); Bookham Common, occasional (Wheeler, *L.N.*, 1954).

BUCKS. Chalfont St. Peter (Ansorge).

Lobophora halterata Hufn. The Seraphim. (p. 148). Add B.24.

KENT. Abbey Wood, 1954 (Showler, *Ent. Rec.*, 1956).

BUCKS. Chalfont St. Peter, three in 1957 (Ansorge).

Mysticoptera sexalisata Hübn. The Small Seraphim. (p. 148).

SURREY. Putney, two in June, 1953 (H. Swain).

Triphosa dubitata Linn. The Tissue. (p. 148). Add B.24.

SURREY. One found hibernating at Godstone in 1958 (Hancock); one in May, 1959, at Oxshott (de Mornay).

BUCKS. Chalfont St. Peter, two in 1958 (Ansorge).

Calocalpe cervinalis Scop. The Scarce Tissue. (p. 149).

KENT. St. Mary Cray, 1957 (Châtelain).

Calocalpe undulata Linn. The Scallop Shell. (p. 149).

SURREY. One at Oxshott in 1957 (de Mornay).

Philereme vetulata Schiff. The Brown Scallop. (p. 150).

SURREY. Wimbledon, one on July 17, 1959 (Dacie); a few at Oxshott in 1959 (de Mornay).

Philereme transversata Hufn. The Dark Scallop. (p. 150). Add B.24.

SURREY. Dulwich, 1957 (Canon Edwards, *Ent. Rec.*, 1957); Bookham Common, a few in the southern area (Wheeler, *L.N.*, 1954).

KENT. Abbey Wood, scarce (Showler, *Ent. Rec.*, 1956).

BUCKS. One in 1952 at Chalfont St. Peter (Ansorge).

Ecliptopera silacea Schiff. The Small Phoenix. (p. 150). Add B.24.

MIDDLESEX. Finchley, 1959 (Keith-Johnston).

KENT. St. Mary Cray and Farnborough (Châtelain).

SURREY. Wimbledon, one in August, 1958 (Dacie).
 BUCKS. Chalfont St. Peter (Ansorge).

Lygris testata Linn. The Chevron. (p. 151). Add B.24.

SURREY. Bookham Common, abundant (Wheeler, *L.N.*, 1954).
 BUCKS. Chalfont St. Peter (Ansorge).

Lygris mellinata Fabr. The Spinach. (p. 151). Add B.24.

BUCKS. Chalfont St. Peter (Ansorge).

Lygris pyraliata Schiff. The Barred Straw. (p. 152). Add B.24.

KENT. Orpington, 1957 (Siggs); Abbey Wood, fairly common (Showler, *Ent. Rec.*, 1956).

BUCKS. Chalfont St. Peter in 1959 (Ansorge).

Lygris fulvata Forst. The Barred Yellow. (p. 152).

SURREY. Bookham Common, a few in the northern area (Wheeler, *L.N.*, 1954).
 BUCKS. Chalfont St. Peter (Ansorge).

Electrophaës corylata Thunb. The Broken-barred Carpet. (p. 152).
 Add B.24.

SURREY. Wimbledon (Dacie); Tadworth, 1956 (Wheeler).

BUCKS. Chalfont St. Peter (Ansorge).

Dysstroma citrata Linn. The Dark Marbled Carpet. (p. 153).

MIDDLESEX. One at Hounslow in 1959 (Pierce).

KENT. St. Mary Cray, 1957 (Châtelain).

SURREY. Bookham Common, one on July 8, 1945 (Wheeler, *L.N.*, 1954); one at Putney in 1953 (H. Swain).

Thera variata Schiff. The Grey Spruce Carpet. (p. 154).

SURREY. One at Wimbledon on October 13, 1959 (Dacie); Oxshott in May, 1959 (de Mornay).

Thera obeliscata Hübn. The Grey Pine Carpet. (p. 154).

SURREY. One at Bletchingley in Sept., 1958 (Hancock).

BUCKS. Chalfont St. Peter (Ansorge).

Thera firmata Hübn. The Pine Carpet. (p. 154).

SURREY. Dulwich in July, 1957 (Canon Edwards, *Ent. Rec.*, 1957, 69, 219).

Lampropteryx suffumata Schiff. The Water Carpet. (p. 155). Add S.17.

MIDDLESEX. Ruislip in 1958 (Minnion).

SURREY. Box Hill, one on April 23, 1957 (Dacie).

Xanthorhoë biriviata Borkh. M.21.

This attractive little moth, which has been named the Balsam Carpet, was first discovered in Britain in 1955 when it was found flying freely among its foodplant, the Orange Balsam (*Impatiens capensis*), in a locality in MIDDLESEX. Since then it has been found to occur in several other restricted areas where this plant grows, chiefly in Surrey, which suggests that the species has been in our midst for some considerable time, but has been overlooked. The insect is double-brooded, flying during the latter part of May and in early August. The second brood is appreciably darker than the first one.

Xanthorhoë quadrifasciaria Clerck. The Large Twin-spot Carpet. (p. 155).

BUCKS. Chalfont St. Peter, 1958 (Ansorge).

Xanthorhoe designata Rott. The Flame Carpet. (p. 156).

KENT. St. Mary Cray (Châtelain).

SURREY. Bookham Common, numerous (Wheeler, *L.N.*, 1954).

Xanthorhoe fluctuata Linn. The Common Carpet. (p. 157).

SURREY. Several melanic examples at Wimbledon, 1958-59 (Dacie).

Colostygia olivata Borkh. The Beech-green Carpet. (p. 157). Add H.20.

HERTS. Taken near Rickmansworth (South, *Entom.*, 1890, 23, 291).

Colostygia pectinataria Knoch. The Green Carpet. (p. 157).

KENT. Orpington, 1957 (Siggs).

SURREY. Bookham Common, plentiful (Wheeler, *L.N.*, 1954).

Colostygia multistrigaria Haworth. The Mottled Grey. (p. 157).

SURREY. Bookham Common, one on April 18, 1947 (Wheeler, *L.N.*, 1954).

Colostygia didymata Linn. The Twin-spot Carpet. (p. 158).

KENT. St. Mary Cray, 1954-1955 (Châtelain).

Rhodometra sacraria Linn. The Vestal. (p. 158).

INNER LONDON. Regent's Park in 1865 (Barrett, 8, 218).

MIDDLESEX. One at Finchley on September 13, 1958 (Keith-Johnston); three near Ruislip in 1958 (Minnion).

KENT. One at Pinden on August 16, 1958 (Hare).

Ortholitha bipunctaria Schiff. The Chalk Carpet. (p. 158).

SURREY. White Hill near Betchingley in 1958 (Hancock).

Ortholitha mucronata Scop. The Lead Belle. (p. 159). Add B.24.

MIDDLESEX. One on July 10, 1958 at Harrow (P. Williams).

KENT. St. Mary Cray, also numerous at Dartford on June 23, 1959 (Châtelain).

SURREY. Wimbledon, 1957 (Dacie); Putney, 1955 (H. Swain).

BUCKS. Chalfont St. Peter (Ansorge).

Larentia clavaria Haworth. The Mallow. (p. 160). Add B.24.

KENT. Orpington, 1949, and Chelsfield, 1948 (A. Swain); Swanscombe, 1952 (Siggs); St. Mary Cray, 1957 (Châtelain); Abbey Wood, 1952 (Showler, *Ent. Rec.*, 1956).

BUCKS. Chalfont St. Peter (Ansorge).

Orthonama lignata Hübn. The Oblique Carpet. (p. 160).

MIDDLESEX. Twickenham (Barrett, 8, 340).

Oporinia christyi Prout. Christy's Autumnal Carpet. (p. 160).

KENT. Orpington, 1949 (Siggs).

Oporinia autumnata Borkh. The Autumnal Carpet. (p. 161). Add M.21, B.24.

MIDDLESEX. One at Hounslow in 1955 (Pierce).

BUCKS. Chalfont St. Peter (Ansorge).

Asthena albulata Hufn. The Small White Wave. (p. 161). Add B.24.

BUCKS. Chalfont St. Peter (Ansorge).

Hydrelia flamineolaria Hufn. The Small Yellow Wave. (p. 162).

KENT. St. Mary Cray (Châtelain).

SURREY. Bookham Common, a few in the northern area (Wheeler, *L.N.*, 1954); Putney, one in June, 1952 (H. Swain).

Operophtera fagata Scharf. The Northern Winter Moth. (p. 163).

SURREY. Bookham Common, abundant (Wheeler, *L.N.*, 1954).

Pelurga comitata Linn. The Dark Spinach. (p. 163). Add B.24.

KENT. St. Mary Cray (Châtelain).

BUCKS. Chalfont St. Peter (Ansorge).

Euphyia unangulata Haworth. The Sharp-angled Carpet. (p. 165).

SURREY. Oxshott, 1957 (de Mornay).

Euphyia luctuata Schiff. The White-banded Carpet. (p. 165).

KENT. Common at Westerham, 1958-59 (C. Edwards).

Euphyia cuculata Hufn. The Royal Mantle. (p. 166).

MIDDLESEX. Ruislip, 1958 (Minnion); one at Kingsbury in July, 1958 (Myers).

HERTS. Whetstone, one on July 11, 1958 (P. Ward).

KENT. St. Mary Cray, 1955 and 1957; also one at Eynsford on June 22, 1959 (Châtelain).

SURREY. Three, 1956 to 1958, at Weybridge (Messenger).

Mesoleuca albicillata Linn. The Beautiful Carpet. (p. 167).

KENT. St. Mary Cray, 1955 (Châtelain).

BUCKS. Chalfont St. Peter, one in 1954 and another in 1956 (Ansorge).

Lyncometra ocellata Linn. The Purple-bar. (p. 167).

SURREY. Bookham Common, frequent (Wheeler, *L.N.*, 1954).

MIDDLESEX. Hounslow (Pierce).

Plemyria bicolorata Hufn. The Blue-bordered Carpet. (p. 168).

MIDDLESEX. Finchley, 1959 (Keith-Johnston).

SURREY. Bookham Common, one on July 10, 1938 (Wheeler, *L.N.*, 1954).

BUCKS. Chalfont St. Peter, scarce (Ansorge).

Melanthisia procellata Fabr. The Pretty Chalk Carpet. (p. 168).

MIDDLESEX. Finchley, one in 1959 (Keith-Johnston).

KENT. Orpington, 1957 (Siggs).

BUCKS. Chalfont St. Peter (Ansorge).

Perizoma alchemillata Linn. The Small Rivulet. (p. 169).

HERTS. Whetstone in 1958 (P. Ward).

KENT. St. Mary Cray, 1957 (Châtelain).

SURREY. Wimbledon, July, 1957 (Dacie); Dulwich in July, 1957 (Canon Edwards, *Ent. Rec.*, 1957, 69, 219).

Perizoma flavofasciata Thunb. The Sandy Carpet. (p. 169).

HERTS. Whetstone, 1959 (P. Ward).

SURREY. Bookham Common, one on May 25, 1953 (Wheeler, *L.N.*, 1954); common at Putney (H. Swain).

Perizoma albulata Schiff. The Grass Rivulet. (p. 169). Add B.24.

SURREY. Tadworth, 1955 (Wheeler); Bookham Common, one on May 24, 1952 (Wheeler, *L.N.*, 1954).

BUCKS. Chalfont St. Peter, one in 1957 (Ansorge).

Perizoma bifaciata Haworth. The Barred Rivulet. (p. 170).

SURREY. Bookham Common, larvae common on red bartsia (Wheeler, *L.N.*, 1954); two at light in June, 1952, at Putney (H. Swain); Forest Hill (*Ent. Annual*, 1862: 118).

Hydriomena furcata Thunb. The July Highflyer. (p. 170).

SURREY. Bookham Common, plentiful (Wheeler, *L.N.*, 1954).

Europila badiata Hübn. The Shoulder-stripe. (p. 171).

SURREY. Bookham Common, frequent records (Wheeler, *L.N.*, 1954; a few at Betchingley in 1959 (Hancock).

Coenotephria derivata Schiff. The Streamer. (p. 171).

MIDDLESEX. Hampstead (Barratt, 1912).

SURREY. Tadworth, 1956 (Wheeler); two in April, 1959, at Betchingley (Hancock).

Nycterosia obstipata Fabr. The Gem. (p. 171).

MIDDLESEX. One on August 25, 1959, at Finchley (Keith Johnston).

HERTS. Two at Whetstone in October, 1959 (P. Ward); one at Arkley in 1959 (Howarth).

SURREY. Two at Epsom in July, 1959 (Tunstall); one at Weybridge on October 16, 1956 (Messenger); Putney, two in June, 1952 (H. Swain).

Horisme vitalbata Hübn. The Small Waved Umber. (p. 172).

MIDDLESEX. Ruislip, 1958 (Minnion).

KENT. St. Mary Cray, 1955-56; also five at Eynsford on August 7, 1959 (Châtelain).

SURREY. Several at Riddlesdown in 1959 (Hancock).

Horisme tersata Hübn. The Fern. (p. 172).

MIDDLESEX. Finchley, 1959 (Keith-Johnston).

SURREY. Dulwich, 1958 (Aston); one at Riddlesdown, 1959 (Hancock).

Species originally described in the *London Naturalist* for 1957 (No. 37).

Eupithecia pulchellata Steph. The Foxglove Pug. (p. 174).

MIDDLESEX. Mill Hill, four in 1955 and one in 1957 (Goater).

KENT. St. Mary Cray (Châtelain).

SURREY. Wimbledon (Dacie).

Eupithecia linariata Fabr. The Toadflax Pug. (p. 174).

HERTS. Whetstone, 1959 (P. Ward).

MIDDLESEX. Larvae common along North Circular Road at Hendon (Goater).

Eupithecia pimpinellata Hübn. The Pimpinel Pug. (p. 176). Add K.16, B.24.

MIDDLESEX. Two at Mill Hill in August, 1955 and many larvae on *Pimpinella saxifraga* in 1959 in this area (Goater).

KENT. St. Mary Cray, 1955-57 (Châtelain).

SURREY. Nine imagines at White Hill near Betchingley on August 9 and 10, 1958 (Hancock).

BUCKS. Chalfont St. Peter, rare (Ansorge).

Eupithecia assimilata Doubleday. The Currant Pug. (p. 177).

KENT. Orpington, 1957 (Siggs).

MIDDLESEX. Mill Hill, one on June 30, 1955, and one on May 5, 1959 (Goater).

HERTS. Whetstone, 1959 (P. Ward).

SURREY. A few at Betchingley in 1959 (Hancock).

Eupithecia absinthiata Clerck. The Wormwood Pug. (p. 177).

MIDDLESEX. Fairly common at light at Mill Hill (Goater).

HERTS. Whetstone, 1958 (P. Ward).

KENT. Abbey Wood (Showler, *Ent. Rec.*, 1956).

SURREY. Wimbledon (Dacie).

Eupithecia goossensiata Mabille. The Ling Pug. (p. 177).

MIDDLESEX. Mill Hill, one on July 30, 1955 (Goater).

SURREY. Wimbledon (Dacie).

Eupithecia denotata Hübn. The Campanula Pug. (p. 178).

KENT. Orpington, 1953 (Siggs).

SURREY. One at light at Putney in June, 1953 (H. Swain); Headley (*Ent. Annual*, 1869).

Eupithecia albipunctata Haworth. The White-spotted Pug. (p. 178).

Add B.24.

SURREY. Putney in 1953 (H. Swain).

BUCKS. Chalfont St. Peter, one in 1953 (Ansorge).

Eupithecia virgaureata Doubleday. The Golden-rod Pug. (p. 179).

Add B.24.

BUCKS. Chalfont St. Peter, one in 1952 (Ansorge).

Eupithecia lariciata Freyer. The Larch Pug. (p. 179).

KENT. Orpington, 1954 (Siggs).

Eupithecia castigata Hübn. The Grey Pug. (p. 179).

KENT. Abbey Wood, common (Showler, *Ent. Rec.*, 1956).

MIDDLESEX. Mill Hill, annually (Goater).

SURREY. Bookham Common, numerous (Wheeler, *L.N.*, 1954).

Putney, one in June, 1952 (H. Swain).

Eupithecia arceuthata Freyer. The Cypress Pug. (p. 180). Add H.20.

HERTS. Whetstone in June, 1959 (P. Ward).

SURREY. Wimbledon, 1958 (Dacie).

Eupithecia succenturiata Linn. The Bordered Pug. (p. 180).

MIDDLESEX. Mill Hill, forty in 1955, very few since then (Goater); Finchley, 1959 (Keith-Johnston).

HERTS. Whetstone, 1958 (P. Ward).

KENT. St. Mary Cray, 1957 (Châtelain).

SURREY. Dulwich (Aston).

Eupithecia haworthiata Doubleday. Haworth's Pug. (p. 181).

KENT. Orpington, 1956 (Siggs).

SURREY. Wimbledon in 1938 and 1958 (Dacie); one at Putney in July, 1952 (H. Swain).

BUCKS. Chalfont St. Peter, scarce (Ansorge).

Eupithecia inturbata Hübn. The Maple Pug. (p. 182). Add H.20.

HERTS. Rickmansworth (R. South, *Entom.*, 1890, 23, 291).

Eupithecia fraxinata Crewe. The Ash Pug. (p. 183).

INNER LONDON. Common in Camberwell about 1900 (Barrett, 9, 105).

MIDDLESEX. Mill Hill, one on July 13, 1955 (Goater).

Eupithecia nanata Hübn. Narrow-winged Pug. (p. 183). Add B.24.

KENT. St. Mary Cray, 1957 (Châtelain); Abbey Wood, 1954 (Showler, *Ent. Rec.*, 1956).

BUCKS. Chalfont St. Peter, one in 1957 and two in 1958 (Ansorge).

Eupithecia abbreviata Stephens. The Brindled Pug. (p. 183).

KENT. St. Mary Cray, 1957 (Châtelain).

Eupithecia dodoneata Guenée The Oak-tree Pug. (p. 184).

SURREY. Wimbledon in May, 1956, and several in May, 1959 (Dacie).

Eupithecia exiguata Hübn. The Mottled Pug. (p. 184).

HERTS. Whetstone, 1959 (P. Ward).

SURREY. Bookham Common, plentiful (Wheeler, *L.N.*, 1954).

Eupithecia sobrinata Hübn. The Juniper Pug. (p. 184).

SURREY. One at Betchingley on July 29, 1959 (Hancock).

Eupithecia subnotata Hübn. The Plain Pug. (p. 185).

HERTS. Whetstone, 1959 (P. Ward).

KENT. St. Mary Cray (Châtelain).

Eupithecia subumbrata Schiff. The Shaded Pug. (p. 185).

MIDDLESEX. One at Mill Hill on June 16, 1955 (Goater).

Chloroclystis coronata Hübn. The V-Pug. (p. 186).

MIDDLESEX. One at Mill Hill on July 26, 1956 (Goater).

KENT. St. Mary Cray, 1958 (Châtelain).

SURREY. Betchingley in August, 1958 (Hancock).

Chlorochlystis rectangulata Linn. The Green Pug. (p. 186).

SURREY. Bookham Common, plentiful at light (Wheeler, *L.N.*, 1954).

Abraxas sylvata Scop. The Clouded Magpie. (p. 187).

MIDDLESEX. Ruislip, 1958 (Minnion).

KENT. St. Mary Cray, 1957 (Châtelain).

Ligdia adustata Schiff. The Scorched Carpet. (p. 188).

SURREY. Several at Riddlesdown on April 23, 1959 (Hancock).

KENT. Abbey Wood, 1952 (Showler, *Ent. Rec.*, 1956).

Aspitates gilvaria Fabr. The Straw Belle. (p. 188).

KENT. Eynsford (Châtelain).

Dyscia fagaria Thunb. The Grey Scalloped-bar. (p. 189). Add (M.21).

MIDDLESEX. Hampstead (Barratt, 1912).

Bapta bimaculata Fabr. The White Pinion-spotted. (p. 190).

KENT. St. Mary Cray, 1954 (Châtelain).

Bapta temerata Hübn. The Clouded Silver. (p. 190).

KENT. St. Mary Cray, 1955 (Châtelain).

SURREY. Putney, one in June, 1953 (H. Swain).

Elloptia prosapiaria Linn. The Barred Red. (p. 191).

MIDDLESEX. Mill Hill, one female on August 6, 1957 (Goater).

SURREY. One at Putney in June, 1953 (H. Swain); a larva beaten from pine at Dulwich, 1959 (Dillon).

Campaea margaritata Linn. The Light Emerald. (p. 191).

MIDDLESEX. Mill Hill, few each year (Goater).

KENT. Orpington, 1956 (Siggs); Pett's Wood (Châtelain); Abbey Wood, common (Showler, *Ent. Rec.*, 1956).

Semiothisa notata Linn. The Peacock Moth. (p. 192). Add B.24.

BUCKS. Chalfont St. Peter, 1959 (Ansorge).

Semiothisa liturata Clerck. The Tawny-barred Angle. (p. 193).

MIDDLESEX. Mill Hill, two in 1957 (Goater); Finchley, 1959 (Keith-Johnston).

SURREY. Box Hill, 1955 (Wheeler).

KENT. Abbey Wood, 1954 (Showler, *Ent. Rec.*, 1956).

Chiasmia clathrata Linn. The Latticed Heath. (p. 193).

HERTS. Whetstone, 1959 (P. Ward).

KENT. Orpington, 1956 (Siggs); St. Mary Cray (Châtelain).

SURREY. Wimbledon, one on August 4, 1957 (Dacie); Betchingley, common in 1958 (Hancock); Dulwich, 1958 (Dillon).

Theria rupicapraria Hübn. The Early Moth. (p. 194).

KENT. Abbey Wood, abundant (Showler, *Ent. Rec.*, 1956).

SURREY. Coulsdon and Box Hill in 1956 (Wheeler); Bookham Common in numbers (Wheeler, *L.N.*, 1954).

Plagodis dolabraria Linn. The Scorch-wing. (p. 196).

SURREY. Wimbledon, 1958 (Dacie).

Ennomos autumnaria Werb. The Large Thorn. (p. 197).

KENT. Pett's Wood, 1953; also one female at Orpington on September 4, 1959 (Châtelain).

Ennomos quercinaria Hufn. The August Thorn. (p. 197). Add B.24.

KENT. Pett's Wood, 1954 (Siggs).

BUCKS. Chalfont St. Peter (Ansorge).

Deuteronomos alniaria Linn. The Canary-shouldered Thorn. (p. 198).

KENT. St. Mary Cray, 1958 (Châtelain).

SURREY. A melanic example taken at Box Hill on July 27, 1955 (J. Howard).

Deuteronomos fuscantaria Haworth. The Dusky Thorn. (p. 198).

MIDDLESEX. Finchley, 1959 (Keith-Johnston).

HERTS. Whetstone, 1959 (P. Ward).

KENT. St. Mary Cray (Châtelain).

SURREY. Wimbledon, 1957 (Dacie); one at light at Betchingley on August 26, 1959 (Hancock).

Deuteronomos erosaria Borkh. The September Thorn. (p. 199).

MIDDLESEX. Finchley, 1959 (Keith-Johnston).

KENT. St. Mary Cray (Châtelain); Abbey Wood, 1952 (Showler, *Ent. Rec.*, 1956).

Selenia bilunaria Esp. The Early Thorn. (p. 199).

SURREY. Bookham Common, plentiful (Wheeler, *L.N.*, 1954).

Selenia lunaria Hufn. The Lunar Thorn. (p. 200).

MIDDLESEX. Hampstead, fairly common (Barratt, 1912).

Selenia tetralunaria Hufn. The Purple Thorn. (p. 200).

MIDDLESEX. Mill Hill, one on July 31, 1957 (Goater).

SURREY. One at Bookham (Wheeler, *L.N.*, 1954).

Apeira syringaria Linn. The Lilac Beauty. (p. 200).

KENT. Abbey Wood, 1952 (Showler, *Ent. Rec.*, 1956).

SURREY. Tadworth, 1955 (Wheeler).

Gonodontis bidentata Clerck. The Scalloped Hazel. (p. 201).

HERTS. Whetstone, a melanic specimen in 1958 (P. Ward).

SURREY. Wimbledon, a melanic example in May, 1959 (Dacie).

Crocallis elingnaria Linn. The Scalloped Oak. (p. 201).

KENT. St. Mary Cray, 1957 (Châtelain).

SURREY. Betchingley in 1958 (Hancock).

Colotois pennaria Linn. The Feathered Thorn. (p. 201).

MIDDLESEX. A few annually at Mill Hill (Goater).

KENT. Westerham, 1953 (Siggs); St. Mary Cray (Châtelain).

Pseudopanthera macularia Linn. The Speckled Yellow. (p. 203).

SURREY. Betchingley, May, 1958 (Hancock).

KENT. Abbey Wood, common (Showler, *Ent. Rec.*, 1956).

Lithina chlorosata Scop. The Brown Silver-line. (p. 203).

KENT. St. Mary Cray (Châtelain).

Apocheima hispidaria Fabr. The Small Brindled Beauty. (p. 204).

Add B.24.

BUCKS. Chalfont St. Peter, 1957 (Ansorge).

Lycia hirtaria Clerck. The Brindled Beauty. (p. 205).

HERTS. A male ab. *nigra* at Totteridge in April, 1959 (Lorimer).

Biston strataria Hufn. The Oak Beauty. (p. 205).

HERTS. Whetstone, 1959 (P. Ward).

KENT. St. Mary Cray (Châtelain); Abbey Wood (Showler, *Ent. Rec.*, 1956).

SURREY. A very melanic male at Wimbledon in March, 1957 (Dacie); Betchingley, two in April 1959 (Hancock).

Hemerophila abruptaria Thunb. The Waved Umber. (p. 206).

MIDDLESEX. Two melanics and two typical forms 1956-57 at Mill Hill (Goater).

Boarmia roboraria Schiff. The Great Oak Beauty. (p. 206).

SURREY. Wimbledon, 1959 (Dacie); also Ashtead in 1935 (Greenwood).

Boarmia punctinalis Scop. Pale Oak Beauty. (p. 207).

KENT. Shoreham, 1954 (Châtelain); Abbey Wood, 1952 (Showler, *Ent. Rec.*, 1956).

Cleora rhomboidaria Schiff. The Willow Beauty. (p. 208).

HERTS. Whetstone, a melanic example in 1959 (P. Ward).

KENT. St. Mary Cray (Châtelain); melanic forms common at Abbey Wood (Showler, *Ent. Rec.*, 1956).

Cleora repandata Linn. The Mottled Beauty. (p. 208).

KENT. St. Mary Cray (Châtelain); melanic forms at Abbey Wood (Showler, *Ent. Rec.*, 1956).

SURREY. A melanic specimen in 1959 at Wimbledon (Dacie); Dulwich, 1958 (Dillon).

Ectropis bistortata Goeze. The Engrailed. (p. 209).

KENT. St. Mary Cray (Châtelain).

SURREY. One at light in April, 1959, at Betchingley (Hancock).

Ectropis crepuscularia Hübn. The Lesser Engrailed. (p. 210).

KENT. St. Mary Cray, 1957 (Châtelain).

Ectropis extersaria Hübn. The Brindled White-spot. (p. 210).

SURREY. Oxshott, 1957 (de Mornay); one at Putney in June, 1954 (H. Swain).

Aethalura punctulata Schiff. The Grey Birch. (p. 211).

KENT. Orpington (Châtelain); Abbey Wood, common (Showler, *Ent. Rec.*, 1956).

BUCKS. Chalfont St. Peter in May, 1959 (Ansorge).

Ematurga atomaria Linn. The Common Heath. (p. 211).

KENT. Abbey Wood marshes (Showler, *Ent. Rec.*, 1956).

SURREY. Common at White Hill, Betchingley (Hancock).

Bupalus piniaria Linn. The Bordered White. (p. 212).

KENT. St. Mary Cray (Châtelain); Plumstead, 1953 (Showler, *Ent. Rec.*, 1956).

SURREY. A gynandromorph taken at Oxshott on June 21, 1928 and an example of *f. lugens* there in 1938 (Dacie); a white form of the male on June 18, 1957, at Wimbledon (Dacie).

HEPIALIDAE

Hepialus fusconebulosa Deg. The Map-winged Swift. (p. 213).

KENT. Shoreham, 1954 (Châtelain).

SURREY. Headley Heath, 1959 (Wheeler).

Hepialus sylvina Linn. The Orange Swift. (p. 213). Add B.24.

MIDDLESEX. Mill Hill, fairly common (Goater).

KENT. St. Mary Cray (Châtelain); plentiful in Abbey Wood and on Plumstead Common (Showler, *Ent. Rec.*, 1956).

BUCKS. Chalfont St. Peter (Ansorge).

Hepialus humuli Linn. The Ghost Swift. (p. 214).

MIDDLESEX. Mill Hill, occasionally (Goater).

KENT. St. Mary Cray (Châtelain); Abbey Wood, very common (Showler, *Ent. Rec.*, 1956).

SURREY. Wimbledon, 1958 (Dacie).

ADDENDUM TO THE BUTTERFLIES

Thymelicus lineola Ochs. The Essex Skipper. (p. 80). Add M.21.

MIDDLESEX. Brent Reservoir, a small colony in 1959 (Batten).

ADDENDUM TO THE MOTHS

Nola albula Hübn. The Kent Black Arches. (Suppt. p. 46). Add K.16.

KENT. Taken near Dartford in 1872 (*Ent. Annual*, 1873).

The conclusion of Part ii of the Supplement to the Butterflies and Moths of London and its Surroundings does not by any means write *Finis* to the study of the Lepidoptera of that Area. In ensuing years it is hoped not only to keep up careful records of the more interesting captures from the London region, but also perhaps to give a short annual review and summary of them. At some more distant date a work embracing the whole of the Microlepidoptera of the Area is envisaged, starting with the Pyrales.

In conclusion I would like to accord my special thanks to the following who have been good enough to send in further most useful records since the main work was finished:—

Mr. L. A. Batten, Mr. R. G. Châtelain, Prof. J. V. Dacie, Mr. T. Dillon, Mr. J. A. C. Greenwood, Mr. J. O. T. Howard, Mr. C. Keith-Johnston, Mr. A. A. Myers, Mr. K. Self, Mr. B. F. Skinner, Mr. P. Ward, Mr. P. Williams.

ANALYSIS BY VICE-COUNTIES OF THE SPECIES IN EACH FAMILY OF THE MACROLEPIDOPTERA

		I.L.	M.21	H.20	E2.18	E1.19	K.16	S.17	B.24	Total for London	Total for U.K. (1959)
BUTTERFLIES											
Revised (1959) ...	...	23	49	47	51	25	53	53	31	59	75
MOTHS											
SPHINGIDAE ...	...	9	16	13	13	6	15	17	10	17	20
NOTODONTIDAE ...	...	6	16	15	15	8	20	19	16	20	25
THYATIRIDAE ...	...	1	8	8	4	2	9	9	6	9	9
LYMANTRIIDAE ...	...	3	7	7	8	3	7	8	7	9	11
LASIOCAMPIDAE ...	...	1	9	7	7	4	9	8	4	10	11
SATURNIIDAE ...	...	—	1	1	1	—	1	1	—	1	1
ENDROMIDAE ...	...	—	—	—	—	—	1	—	—	1	1
DREPANIDAE ...	...	3	5	5	5	4	4	5	3	5	6
NOLIDAE ...	...	1	3	4	3	1	4	2	3	4	5
HYLOPHILIDAE ...	...	2	4	3	3	2	4	4	3	4	5
ARCTIIDAE ...	...	5	20	18	18	8	19	22	14	24	30
ZYGAENIDAE ...	...	1	4	4	4	1	4	5	2	5	10
COSSIDAE ...	...	1	2	3	2	1	2	3	1	3	3
LIMACODIDAE ...	...	—	1	—	1	—	1	2	—	2	2
SESIIDAE ...	...	3	6	8	5	—	11	10	1	12	15
NOCTUIDAE ...	...	110	229	212	190	105	239	250	159	281	377
GEOMETRIDAE ...	...	52	199	192	165	94	221	226	157	247	295
HEPIALIDAE ...	...	2	5	5	4	1	5	5	3	5	5
TOTALS (MOTHS) ...		200	535	505	448	240	576	596	389	659	831
GRAND TOTALS ...		223	584	552	499	265	629	649	420	718	906

ERRATA

Butterflies:—

p. 67, l. 18. After "*Limenitis camilla*," add "Linn."
 p. 75, l. 35. For "Hayleybury," read "Haileybury."
 p. 80, l. 20. For "1878 list," read "1898 list."

Moths. Part i:—

p. 36, l. 19. For "*Callimorpha dominulu*," read "*Callimorpha dominula*."
 p. 37, l. 1. After "*Callimorpha jacobaeae*," for "S.16, K.17," read "S.17, K.16."

Part ii:—

p. 62, l. 12. For "*Triphaena subsaequa*," read "*Triphaena subsequa*."
 p. 72, l. 31. After "*Eumichtis adusta*," insert "H.20" after "M.21."

Part iii:—

p. 95, l. 3, from bottom. After "*Caradrina morpheus*," insert "I.L., M.21, H.20, E2.18, E1.19, K.16, S.17, B.24."
 p. 96, l. 22. For "*Caradrina taraxici*," read "*Caradrina taraxaci*."
 p. 107, l. 27. After "*Agrochola lota*," for "[E.19]," read "[E.19]."
 p. 127. l. 26. After "*Catocala electa*," for "(M.20)," read "(M.21)."

Part iv:—

p. 149, l. 34. For "Brown Scallop," read "Scallop Shell."
 p. 157, l. 17. After "*Colostygia pectinataria*," for "K.18," read "K.16."
 p. 214, l. 35. For "Mr. L. Wakely," read "Mr. S. Wakely."
 p. 215, l. 40. For "*Nymphalis polycloros*," read "*Nymphalis polychloros*."

Stane Street at Morden: 1959 excavations

By D. J. TURNER

STANE STREET, the Roman road from Chichester to London, is well known and documented (Margary, 1948) but its course had not been tested in the Morden area until this Society's excavations in 1958 (Turner, 1959). These excavations suggested that in Morden Park the line of the road is slightly different to that previously assumed. The positions of the two sections cut in 1958 are shown on the strip maps where they are numbered LNHS 1 and LNHS 2; this numbering conforms with that adopted by Margary (1948). Complete details of each section have been recorded in the Archaeological Section's record book.

In 1959 three more sections were cut across the line of the road indicated by the 1958 work. They were as follows:

Section LNHS 3 (Grid Ref.: TQ 25006755). Cut to the north-west of Morden Park Cottages in bad weather in March. An ill-defined layer of gravel twelve feet wide and up to one foot thick was discovered. The gravel rested directly on undisturbed London Clay and was covered by humus and plough soil. At its north-western edge it partially overlay a shallow, gley-filled, u-section ditch some three feet wide. The point where the gravel was found was exactly in line with the 1958 discoveries.

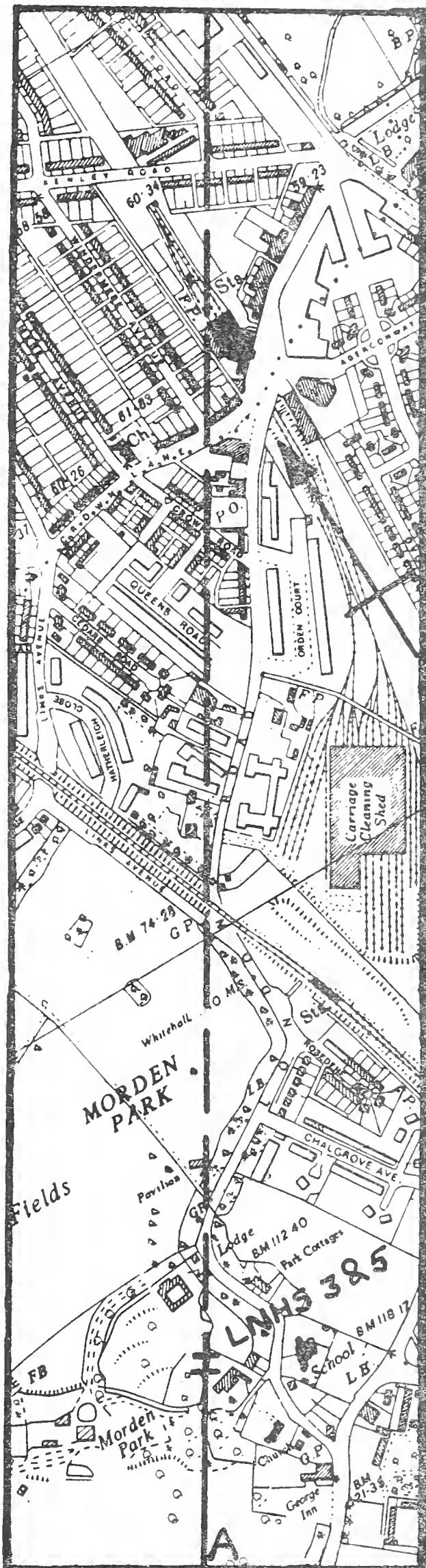
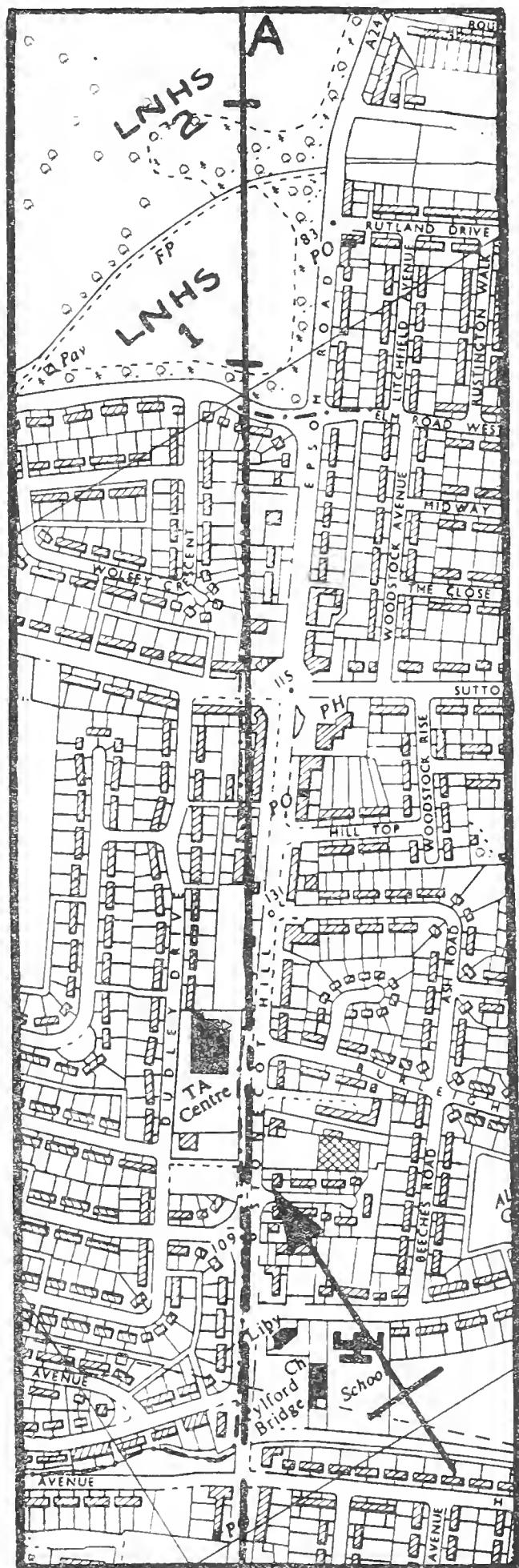
Section LNHS 4 (Grid Ref. : TQ 25046767). Cut to the south of Morden Park Lodge (seventy yards north-east of LNHS 3) in August. No remains were found in this section. The topsoil was deep and contained occupation debris covering much of the last three centuries.

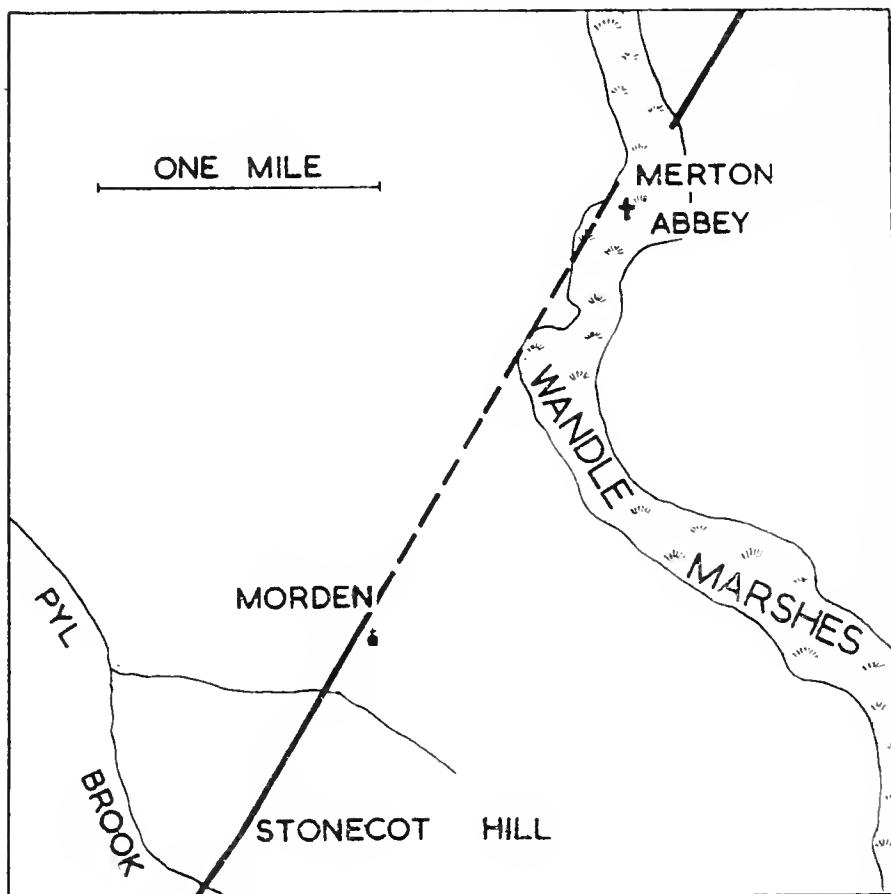
Section LNHS 5 (Grid Ref.: TQ 25006754). Cut some fifty feet to the south-west of LNHS 3. Here the north-western edge of the road was found. The surface was only one foot below the turf. The road consisted of a layer of first-sized flints resting on gravel. A well defined rut was visible in the surface. Time prevented the party from sectioning the road and its width could not be determined because of the presence of a ditch and hedge.

We now have four points at Morden where the road has been found. All these points lie on a single straight line. To the south-west this line coincides with the boundary of Morden and Sutton between Lower Morden Lane and the top of Stonecot Hill. At this point (Grid. Ref.: TQ 243664) it meets the main alignment of Stane Street from Ewell, making a change of direction of about five degrees.

The course of the road is now clear as far as the summit of the ridge on which Morden Church stands. It remains to discuss the course to the north-east of this. As the sketch map shows, the Stonecot Hill-Morden alignment does not intersect the Kennington-Tooting line. It appears, in fact, to be a diversion aimed at easing the crossing of the Wandle and its marshes.

To-day the Wandle Marshes in the Merton Abbey area are difficult to appreciate; much that remained in 1945 has since been obliterated by systematic tipping and by factory building. An estimate of the boundaries of the marshland here in Roman times, such as that shown on the sketch map, can only give the general picture. The diversion at Stonecot Hill might have enabled Stane Street to stay on dry ground before crossing the





Approximate extent of the Wandle marshes in Roman times in relation to the alignments of Stane Street. Established portions of Stane Street are shown as continuous lines, inferred portions by broken lines. This convention applies also to the strip maps.

Wandle by means of a short subsidiary alignment, which would have run approximately east-west. Such a crossing could have occurred where the present road A24 bridges the river. It is possible, however, that a further slight diversion westwards took place before the marshes were reached: future work should show whether this was so.

The writer's thanks are due to all the members of this Society, the Merton and Morden Historical Society and the Surrey Archaeological Society who have given invaluable help with spade, fork and baling can. Especial thanks are due to Mr. F. J. Collins who helped in many ways and did all the surveying, and to Miss E. M. Jowett who negotiated the necessary permits to dig. The Merton and Morden U.D.C. and its employees were most helpful and co-operative throughout, as was Mr. R. G. Jones, the tenant of much of the land on which we dug.

THE MORDEN LIBRARY SITE

At the junction of Kenley Road and Morden Road (Grid Ref.: TQ 256688) the Surrey County Council have recently built a library and clinic which lies across the previously assumed line of Stane Street. Permission was kindly given for the foundation trenches to be examined as they were dug. Remains of the farm which had stood on the site were found. Where the previously assumed line crossed the site there were visible in the trenches traces of a shallow pond. Nothing resembling the remains of a Roman road was observed.

REFERENCES

MARGARY, I. D., 1948, *Roman Ways in the Weald*, London.
 TURNER, D. J., 1959, *Lond. Nat.*, 38, 22-23.

Obituary

Lawrence John Tremayne

1873-1959

(Plate 3)

With the death of L. J. Tremayne the Society has lost the sole survivor of the leading characters of its early days. He played a prominent part in our activities for *nearly 60 years*, a unique record.

Tremayne was born in Pimlico on March 15, 1873, educated at University College School, and subsequently practised as a solicitor at Charing Cross for 53 years. He was an early member of the schoolboy club (The Grocers' Company's School Science Club) which by 1892 had grown into the North London Natural History Society. Although according to the Society's published list of members, Tremayne joined in 1892, in fact he became a member of the parent club about 1888, serving on its Council in 1891. He was Secretary of the N. London Society from 1893 until his Presidency in 1899 and Treasurer from 1901 to 1907, when he was elected Vice-President. He was also a member of the rival City of London Entomological and Natural History Society, where he was elected Joint Secretary in 1895, resigning suddenly in November, 1898, apparently through disagreement with his co-secretary: his name does not appear in the first published list of members of 1901.

A good deal of the story of those early years, and of Tremayne's part in it, was given in his reminiscences "The North London Society in 1892 and Onward," contributed at the request of Council to the centenary issue of *The London Naturalist* (1958, *Lond. Nat.*, 37, 6-8). But the last service which Tremayne rendered our Society was to bequeath some copious manuscript notes for his obituary, and from a perusal of these some interesting facets of his career have come to light. (Unfortunately these reminiscences were written too late in life, when his memory of more recent activities and of dates and sequence had failed).

Those of us who remember him in his later years will always think of him as a strong personality, with individual views often opposed to those of his colleagues, and expressed forcibly and pungently but not unkindly in his deep resonant voice. There seems little doubt that he was always an individualist, and his autobiographical notes (which have been deposited in the Society's library) suggest that he had frequent disagreements with the majority on Council throughout the very many years in which he served, in one capacity or another, on that body.

Although he played a prominent—and possibly the leading—part in the formation of the Archaeology Section in 1917, Tremayne's special contribution to the Society in its later years was the creation of the Ramblers' Section, first as a Ramblers' Committee in 1925, of which he was Secretary and the leader of its earliest rambles. Within six months the Committee had been elevated to Sectional status with Tremayne once again its Secretary and leader of its first excursion in January, 1926. His idea was that there were in the Society members who had no particular interests and who were reluctant to join a specialist section owing to a supposed lack of knowledge. He thought a Ramblers' Section with no specific object except country walks would afford an opportunity for "unattached" members to meet members of other Sections informally and "discover" themselves, and then eventually be led to join a specialized Section of their choice. In his own words, "It was a new idea of my own,

to provide a section whose members should have no obligation to do any scientific work, or anything else but enjoy themselves. We had a very successful first year. I once scandalized some members, to my great delight, by sending round a circular inviting those attending an excursion under my leadership to join me in taking gin and bitters at a pub. before lunch." He remained Secretary of the Ramblers' Section until 1929 and was Chairman from 1940 to 1946 and then on its Committee until 1950.

In 1904 "Research Committees" were set up and Tremayne was appointed Secretary of the Protection Committee—for the Preservation of the District Fauna and Flora, Footpaths, etc. The Committee dealt successfully with a number of cases of threats to public footpaths until its dissolution in 1910, the reasons for which make curious reading: "The Protection Committee finding that demands on the time of its members were increasing and believing that such cases as were brought to its notice could be dealt with by the Society or by some other committee, passed a resolution of dissolution as from June 30th last." However, more than 30 years later, Tremayne's last major activity in the Society was more successful. He was appointed Chairman of the Council's new Nature Reserves Investigation Sub-Committee in 1943. The Committee met at frequent intervals at his office in Trafalgar Square under his efficient but genial and encouraging guidance from May, 1943, until the end of 1945, except for an interruption in 1944 caused by the activities of flying bombs and rockets when both the Chairman and the Secretary found themselves with more urgent personal troubles to attend to. Occasional meetings were held until August, 1947, when the Committee drew up its final report, tendered its resignation and suggested the formation of a more broadly based permanent committee. The new committee was appointed in October, 1948, but Tremayne, now 75, felt unable to serve on it.

When he gave up his legal practice and retired to Brighton in 1950, and thus had to relinquish active participation in the Society's affairs, Tremayne had held nearly every office in the Society and in the Sections, and had rarely been off the Council. At various times he was Recorder for Entomology and for Ornithology, Secretary of the Archaeology and Botany Sections, Chairman of Plant Galls and Entomology Sections, President of the Research Section and Director of Sectional Organization. He was elected President of the Society for 1930-1. His address in 1930, "The Unseen Will" (published in the *London Naturalist*), was philosophical in nature. His address in 1931, "The Society and its Future," was unfortunately not printed, although commented on in the editorial of the *Lond. Nat.* for 1931: "The address by the retiring President, Mr. L. J. Tremayne, in December, contained many valuable suggestions for improving the work and status of the Society. Careful consideration is being given by Council to these suggestions, some of which will, it is hoped, be acted upon in the present year." Tremayne (in MS) states that nothing came of his suggestions but he does not enlighten us as to their content.

He had almost a mania for recording and indexing, and before leaving London he handed over his huge mass of records to the Society. For nearly every British county he had a separate interleaved London Catalogue of British Plants, British Bird List, Lepidoptera, Coleoptera, Hemiptera and other published lists. All these were marked and annotated with both his own personal records and published ones that he had come across. His own notes were mostly of the common and easily recognized



Lawrence John Tremayne
1873-1959



Cyril Leslie Collenette
1888-1959

species. The Home Counties record books have been kept by the Society and many of the others were given to local Societies likely to be interested in them. Several Sections in their annual reports have paid tribute to Tremayne's valuable work in noting the distribution of the commoner species.

Also before leaving London, Tremayne presented the bulk of his natural history library to the Society, a generous donation which included many county Faunas and Floras.

As he himself says in his notes, he was never a scientist, and his service to the Society was essentially as organizer and recorder. But he was undoubtedly one of the principal architects of our present structure. He played a great role as a valuer of suggestions on policy and research. His standing in the Society and his orderly mind and legal training secured acceptance of schemes that he recommended. Thus the formation of the Ecology Section in 1936 was greatly helped by his recommendation to Council that it should approve the new venture.

Tremayne married Miss J. B. Farthing, a member of the Society, shortly before the First World War. There were no children, and his wife died in 1946. After nine years of retirement at Brighton, he died in his sleep on July 13, 1959, at the age of 86.

C.P.C., L.P., R.M.P.

One of Tremayne's important services to the Society, in my opinion, was his insistence on the adoption of formal business-like methods for the conduct of committee meetings of the various sections of which he was a member.

I recall that, when I reluctantly accepted the chairmanship of the Botany Section in succession to R. W. Robbins, Tremayne wrote to me a lengthy letter setting forth what he considered were the duties of a chairman and the rules for the proper conduct of meetings. He described formal proceedings in detail and the reasons for them, mentioning even such details as a formal announcement of the opening of a meeting and a declaration that the meeting was closed after agenda items had been dealt with. He insisted on members addressing the Chair and it was very annoying to him if discussions took place across the table between individual members.

Pomposity he disliked, but a forthright speaker with a gift for gentle sarcasm appealed to his sense of humour, as did also the mannerisms of "characters" and "oddities." He himself was a fluent speaker on most subjects, following his own rule of "keeping to the point."

There can be no doubt that he had great influence with members "behind the scenes" and his advice was always given with a view to the welfare of the Society. He was always generous in placing his office in Grand Buildings, Trafalgar Square, at the service of committees of the Sections in which he was interested, without fee.

Originally his natural history interest was entomology but he later interested himself in botany and acquired a number of county Floras which he studied seriously, becoming an authority on the botany of the Home Counties, particularly Middlesex, and it was a source of regret to him when so much of this interesting county became appropriated by the builder.

H.S.

I am glad to respond to the request of the Editor to pay my tribute to my old friend Lawrence Tremayne. He was a genial friend and always

willing to help younger members of Society on various branches of nature study. He had a clear legal mind and a keen sense of humour. I have always remembered one story he used to tell with great glee. A young lady brought a specimen to the leader for identification. "Why, my dear," was the reply, "that is the Bloody Dogwood." Collapse of young lady. At one time, he and I were frequently called upon to propose or second the vote of thanks to the speaker at lectures, and he always found something to say that was apt or amusing. During the War years when I was President he always proposed the vote of thanks to the President for his address, which he did in the following terms: "We have a custom in the Society that we do not criticize the President's speech, so I will now propose a vote of thanks to him." I never knew whether my address was appreciated or not.

He was a great rambler and those who went in to the highways and byways of Surrey would see a familiar figure with rucksack on his back popping in or out of one of his favourite "locals." A very human and lovable man and a great lover of nature.

J.B.F.

**Cyril Leslie Collenette
1888—1959**
(Plate 3)

Cyril Leslie Collenette was born on January 13, 1888, at Woodford Green, Essex, being the youngest of four sons of A. E. Collenette of Guernsey and Catherine Large of Boston, Lincolnshire.

Educated at the Forest School, Essex, he started collecting butterflies, moths and birds' eggs at an early age and was awarded the Elliot Prize for Natural History. While still at school he founded the Woodford Natural History Society in 1904, which amalgamated with the North London Natural History Society in 1907. Together with A. B. Hornblower, he then formed the Woodford Branch with over 100 members, and in 1908 was the first Secretary of the Ornithological Research Committee, the forerunner of the Society's Bird Record Committee. The Council's Report for 1907 already refers to "our valued ornithological worker C. L. Collenette."

After leaving school he travelled in Germany, Czechoslovakia, Holland and Belgium. In 1911 he passed the finals as a Chartered Accountant and in 1912 went out to the Straits Settlements to work for a firm of agents for rubber estates and tin mines. His departure oversea was a blow to the Society as is shown by the Council's Report for 1913. "The Woodford Branch and the Society have suffered a serious loss by the removal of Mr. C. L. Collenette to Penang. Mr. Collenette organized the Woodford Branch and became its Secretary; he was Secretary of the Ornithological Research Committee, Curator of the Ornithological Collection and the keenest and most active of the Society's younger members. The vacancy in our midst caused by his departure will be difficult to fill."

Collenette travelled frequently in all the States of the Malay Peninsula making extensive collections of Lepidoptera and plants in his spare time. He also did the same while holidaying in Java and Sumatra. He took an active part in canoe sailing and water polo, and was a member of the Singapore Volunteer Artillery. Passed fit for home service in 1916 he was torpedoed near Malta on the journey back and lost all his Natural History collections. After serving in France in the Tank Corps till the end of the war, he returned to Malaya, but left at the end of 1922.

From 1923 to 1925 he was Scientific Secretary of the "St. George Expedition" to the South Pacific, helping in the organization and then taking part. It was on this expedition that the writer of this obituary joined forces with him in collecting the Lepidoptera, Coleoptera and most of the plants. In 1925 his book on the expedition, called *Sea-girt Jungles; the experiences of a naturalist with the St. George Expedition*, was published by Hutchinson. From 1926 to 1930 Collenette made extensive collecting expeditions to other parts of the World: French Guinea, Liberia and the Ivory Coast, on foot and on a bicycle, alone for six months; Matto Grosso and Bolivia for ten months, half the time with the writer and Miss Gwen Dorrien-Smith; and eight months with the British-Italian Boundary Commission to British Somaliland, being invalidated home with Blackwater fever. The plants collected on these expeditions are at Kew Herbarium, while the Insect orders, Reptiles and Amphibia are at the British Museum (Natural History).

At intervals between expeditions, Collenette worked at Tring, Witley and the British Museum on the family *Lymantridae* (Tussock Moths). From 1931 onwards he worked full-time on this group of moths as an Associate of the British Museum and was virtually the world authority, publishing well over 50 papers on them.

He moved, on the death of his mother in 1931, from Woodford Green to Richmond and married in 1932 Célie Gloor, who survives him. This was a very happy union. For many years he was official Bird Observer for Richmond Park, being chosen by the Committee on Bird Sanctuaries of Royal Parks to replace Mr. Rudge Harding after the latter's resignation, in 1932. Collenette published a *History of Richmond Park, with an account of the Birds and Animals* in 1937. In that year also he became President of our Society. From 1934-36 he was on the Council of the Royal Entomological Society of London, and also a Vice-President. He was again on this Council from 1949-52.

During the Second World War, he first worked at Richmond as a full-time Air-raid Warden, but had to resign on doctor's orders and then moved to Derbyshire and became Secretary to the Parwich Red Cross Hospital. On his return to his Richmond house, he again took up his work in the B.M., which he continued to his death. He moved, however, to Surrey in 1951 and reduced his journeys to London to four days a week. He then ceased to attend the Society's evening meetings or the week-end rambles. However, he still worked hard on Mr. R. C. Homes' committee, which was compiling the great work *Birds of the London Area since 1900*. Having started the first Ornithological Research Committee as far back as 1908, he was a much appreciated link with the past.

In addition to the works already mentioned, Collenette's principal publications were as follows:

Observations on the bionomics of the Lepidoptera of Matto Grosso, Brazil. Trans. ent. Soc. Lond., 1928, 76: 391-416. (Collenette and Talbot.)

The Arctiidae, Noctuidae and Sphingidae of the St. George Expedition from French Oceania. Trans. ent. Soc. Lond., 1928, 76: 469-87.

North-eastern British Somaliland. Kew Bulletin, 1931, 8: 401-14.

Arctiidae, Noctuidae and Sphingidae of the Marquesas Islands. Pacific Ent. Surv., 1934, 7: 201-9.

During his long service to our Society, Collenette held in turn the offices of Director of Sectional Organization (1934); Syllabus Secretary (1939);

member of the Entomological, Ornithological and Botanical Committees, Entomological Secretary (1935-6), Botanical Chairman (1945-8), and on the Council (1928-39, 1946 onwards); Hon. Auditor; President (1937-8), Vice-President (1948 onwards) and latterly Honorary Vice-President (1957 onwards). In addition to those in our Society and the Royal Entomological Society, his most valuable, and most arduous, office was serving on the Official Committee on Bird Sanctuaries in the Royal Parks (England and Wales), when the latter was revived in 1947 under the chairmanship of Sir Cyril (now Lord) Hurcomb. Collenette shared the editing from 1950 with the Secretary of the Committee, of the official Observers' reports, which required extensive condensing before publication in *Bird Life in the Royal Parks* produced by H.M. Stationery Office.

All through his life Collenette equally divided his attention between entomology, ornithology and botany. He was always prepared to serve the cause of any of them, and was a valuable member on many a committee and council. His advice was always sound and constructive, his approach always friendly and tactful, while his knowledge and memory were more than average. He kept his youthful enthusiasm and energies to the last, so much so that the two days' illness from which he died on November 2, 1959, was brought on by his pickaxeing up some hard ground to make a flower bed.

To all members of the Society his loss will be a grievous one, but to none more so than the writer of this tribute. For thirty-five years his friendship has been very greatly valued. It all began with the "St. George Expedition," where he was one of the two official entomologists aboard and where the writer became his assistant. No one could have been a more considerate or interesting companion and he remained exactly the same for the rest of his life. He always saw the sunny side of everything, and had a great tolerance for all men and beasts, without being in the least sentimental about them. He had a great sense of humour, not perhaps realized by those who did not know him well, as it was partially hidden by a certain quiet reserve. We have had to mourn in the last few years the deaths of many staunch supporters of the Society, but none will be more regretted than that of C. L. Collenette.

C. E. L.

Books

A handbook to the collections illustrating A Survey of the Animal Kingdom,
by G. E. Williams, pp. 92, 4 plates, plan, text-fig. London
County Council, Horniman Museum and Library, Forest Hill,
London. 3rd Ed. 1959. 2s. 6d., postage extra.

This is the first to be revised of this museum's excellent handbooks. The last edition, in paper covers, was published in 1922 for 6d. This edition, attractively bound in cloth and printed in larger and more pleasant type, provides a useful, readable and up-to-date summary of the classification of animals, mostly down to classes and sub-classes, and to orders in the higher vertebrates. There is a glossary and list of books.

C.P.C.

British Caenozoic Fossils (Tertiary and Quaternary), pp. vi, 130 (44 plates).
British Museum (Natural History), London, 1959 [1960]. 6s.

This first-rate publication by the British Museum (Natural History) has been issued in response to repeated requests for a simple and inexpen-

sive work to enable the non-specialist to know what fossils he may expect to find, and enable him to identify for himself those he has collected.

The excellent plates give no fewer than 354 illustrations of the very many species recorded from the British Caenozoic.

The preparation of this series was initiated several years ago by the late Keeper of Palaeontology, Mr. W. N. Edwards, and was put in the hands of the distinguished amateur geologist and artist Mr. A. G. Wrigley, whose untimely death when some 60 excellent drawings had been completed stopped the project for some considerable time. When opportunity allowed the work to be restarted it was put in the capable hands of our member Mr. C. P. Castell. Most of the figures not by Mr. Wrigley are the work of two artists, Miss L. D. Buswell and Miss L. Ripley, who, working with Mr. Castell's expert knowledge to guide them, spared no effort to achieve a standard of perfection down to the last detail.

Many of the scientific and experimental staff of the Palaeontological Dept. have helped in the compilation, but the bulk of the work has been carried out by Mr. Castell and edited by the Deputy Keeper, Dr. H. M. Muir-Wood.

The publication is excellent value for the very moderate cost.

R.F.M.

Insects and Their World, by Harold Oldroyd, pp. viii + 139, illustrated by 60 plates and 18 text figures. British Museum (Natural History), London, 1960. 7s. 6d.

Anyone looking for a simple, direct introduction to the world of insects (*living* insects be it noted) should unquestionably take into consideration this small volume. And, for that matter, anyone who appreciates books but dislikes insects should still be able to get some enjoyment from it.

Mr. Oldroyd has skilfully chosen his insects and with the not inconsiderate aid of some excellent photographs and drawings, has made his subjects come alive in a way too seldom associated with Museum Handbooks in the past. This book is designed not as a guide to any museum collection, but to be a companion to be taken round the galleries, to be read again in the train going home and to share with one's fellow naturalists.

It is understandable that it has been thought unnecessary to identify but few of the insects illustrated beyond their order, but many readers, flattering themselves as having passed the introductory stage, could appreciate both specific identification and region of origin of the specimens shown; perhaps such data could be included in an appendix. The omission of indications of scale of dimensions is a more important matter.

This Society as a whole, and many of its members as individuals, owe much to the expert advice of the South Kensington specialists, and in this volume many more will find a welcome extension of the helping hand. For this, we thank Mr. Oldroyd and his collaborators and we offer our congratulations to all concerned in this extremely well-produced and reasonably priced book.

J.F.S.

Taming and Handling Animals, by Maxwell Knight, O.B.E., F.L.S., pp. 120, 20 plates. G. Bell & Sons, Ltd., London, 1959. 12s.

Major Maxwell Knight has been aptly described as having the zoological equivalent of "green fingers," and has earned the respect of anyone who keeps animals which cannot be accurately described as "domestic."

The author has dealt with orthodox pets before; now, drawing mainly from his own long experience, he considers those wild creatures, British and foreign, small and medium-sized, which can be successfully cared for in the ordinary home. Space is devoted to insects, fish, amphibians, reptiles, birds, and many mammals from badgers to bush-babies, but much of the advice given is of general rather than specific application.

Although this is essentially a book for the youngster, it is written in a way that need make no young person feel that he is being treated as such. The information provided is of value to *all* pet-keeping naturalists, irrespective of age. The author emphasises the need for the pet owner to find out as much as he can about an animal's basic requirements before trying to keep it, and in dealing with the acquisition of animals he makes some outspoken and necessary adverse criticism of the appalling conditions prevailing in many of our pet shops to-day. He offers advice on the problems of housing and feeding, and as the title promises, the all-important art of animal handling. For those of us who have hand-reared young birds of prey there are valuable hints on how to train these birds to hunt for their own food.

Some of Major Knight's statements may be challenged by the cold-blooded scientist, e.g. the suggestion that a mammal may be able to detect the smell of adrenalin in the sweat of a person who touches it with apprehension. Anyone with experience of "difficult" animals, however, knows that human fear is communicated to them in some way, and the shrinking, hesitant, uncertain hand is very likely to be bitten. Who can say with certainty that adrenalin has no scent for animals whose olfactory organs are superior to ours? As Kipling's Quoodle remarked, we, the Fallen Sons of Eve, "haven't got no noses."

The book is well illustrated by photographs, mostly of the author's charges, but some of the references to them in the text are rather oddly placed. To quote one example, one photograph which shows a mongoose on a sleeping boy's pillow is linked with a summary of advice on where animals like to be stroked or scratched!

This is a book which every naturalist family should have, and which should be added to every school library.

W.G.T.

A Key to the British Fresh- and Brackish-water Gastropods with notes on their Ecology, by T. T. Macan, M.A., Ph.D. Illustrated by R. Douglas Cooper, F.R.S.A. Pp. 47; 15 figs. Freshwater Biological Association, Scientific Publication no. 13, 2nd Ed. 1960. 3s. (postage 4d.), obtainable from the Librarian, The Ferry House, Far Sawrey, Ambleside, Westmorland.

This is still by far the best and cheapest guide of its kind for the beginner, every British species being figured and keyed, with short notes on their ecology. It is practically a word-for-word reprint of the first edition, but with the useful addition of an index. The names used are those in A. E. Ellis' "British Snails," 1926, still the standard work. Although no one can hope that all experts will ever agree on anything, the statement in the Introduction that "there is at the present time no check-list of names on which all experts can agree" seems no longer correct, in view of the publication in 1951 of Ellis' "Systematic Conspectus" in the Conchological Society's "Census of the Distribution of British Non-Marine Mollusca."

C.P.C.

The following books have also been added to the Society's Library at Eccleston Square:—

W. S. Bristowe, *The World of Spiders* (1958).
 E. Brown, *Eagles* (1923).
 J. J. Bullen, *Creatures of the Sea* (1911).
 Catalogue of Selborne Society Library, Ealing.
 R. Chislett, *Birds on the Spurn Peninsula* (1958).
 Clapham, Tutin and Warburg, *Excursion Flora of the British Isles*.
 G. J. Copley, *An Archaeology of South East England* (1958).
 W. D. Campbell, *Bird Watching as a Hobby* (1959).
 T. A. Coward, *Birds of the British Isles* (1920).
 T. A. Coward, *Migration of Birds* (1912).
 Cross and Cole, *Modern Microscopy*.
 P. Crowscroft, *The Life of the Shrew* (1957).
 Directory of Natural History and Field Study Societies (1959).
 J. Fabre, *Bramble Bees and others* (1915).
 D. English, *100 Photographs from life*.
 J. Fisher, *Adventure of the Air* (1959).
 E. Fitch Daglish, *Enjoying the Country* (1952).
 Geologists Association Guides 1959. Dorset Coast, London Region.
 Oxford, Southampton, South Shropshire, The Weald.
 Geologists Association *Proceedings*, Vols. 65 and 68.
 H. Godwin, *The History of the British Flora* (1956).
 Handlist of Plants in London Area.
 E. W. Haslehurst and W. Jerrold, *The Heart of London*.
 E. W. Haslehurst and W. Jerrold, *Rambles in London*.
 O. and K. Heinroth, *The Birds* (1959).
 J. M. Hobson, *The Book of the Wandle* (1914).
 L. Howard, *Living with Birds* (1956).
 W. H. Hudson, *British Birds* (1911).
 H. A. Hyde and K. F. Adams, *An Atlas of Airborne Pollen Grains* (1958).
 Linnaeus, *Species Plantarum* (1753).
 I. D. Margary, *Roman Roads in Britain* (1) (1955).
 I. D. Margary, *Roman Ways in the Weald*.
 H. J. Massingham, *Chiltern Country* (1940).
 B. Melville Nicholas, *The Nature Lover's Handbook* (1952).
 R. D. Meikle, *British Trees and Shrubs* (1958).
 National Trust. Properties near London open to the Public.
 Natural History of the Scarborough District. Botany and Geology.
 H. Oldroyd, *Collecting, Preserving and Studying Insects* (1958).
 Prud'homme Van Reine, *Plants and Animals of Ponds and Streams* (1957).
 J. Rignall, *Weetabix Wonder Book of Birds* (1959).
 A. Sanders, *A Beast Book for the Pocket* (1957).
 G. Salt, *Parasite Behaviour and Control of Insect Pests*.
 T. H. Savory, *The World of Small Animals* (1955).
 D. Seth Smith, *Birds of our Country*.
 N. Tinbergen, *Curious Naturalists* (1958).
 C. F. Tunnicliffe, *Bird Portraiture* (1945).
 A. K. Wells, *Outline of Historical Geology* (1951).
 R. E. M. Wheeler, *London and the Saxons* (1925).
 Willy Ley, *Dragons in Amber* (1951).
Journal of Animal Ecology, Vol. 26.
Journal of Society for British Entomology, Vols. 2, 3, 4.

Transactions of Society for British Entomology, Vols. 8-12.

Entomologist's Monthly Magazine, Vols. 92 and 93.

London Naturalist, 1954-58.

Nature Conservancy, Report of first ten years.

and many County and Local Societies' Reports, also reprints from Scientific Publications.

Resident British Birds: Filmstrip No. CX6208, produced by Educational Productions Limited, in collaboration with The Royal Society for the Protection of Birds. Photographs by Eric Hosking, with notes by Philip Brown. July, 1959.

This is the twelfth issue in a series on avian subjects designed mainly for use in schools, but also available to students in natural history groups and elsewhere. In all, thirty-three resident British species are illustrated in colour, and Mr. Hosking's excellent photographs require no further recommendation than that they will show to all who care to look, the wealth of beauty exhibited even by our commonest species. Most of the frames show the birds at their nests and Mr. Brown's companion notes give the necessary complement of concise and accurate information on breeding behaviour, song, distribution and, in some cases, similar species not actually figured in the filmstrip. As a simple introduction to Britain's own birds, it is to be wholly recommended.

D.I.M.W.

Other filmstrips have also been received from Educational Productions Limited, dealing with *Grasses*, *Flowers of Marsh and Pool*, *Seed Germination*, and *The Hedgerow*.

Nature Conservation in the London Area

Report on activities of the Nature Conservancy, 1958-59

By DR. W. A. MACFADYEN and DR. P. A. GAY

DURING the past two years the cause of nature conservation in South-east England has been strengthened by the formation of Naturalists' Trusts covering the counties of Berks., Bucks., Essex, Kent and Surrey. The Conservation Corps of the Council for Nature has already shown its capacity in several Sites of Special Scientific Interest in the area covered by the L.N.H.S. The formation of these bodies brings recognition of the need for the active participation of naturalists in the areas of biological interest, if such areas are to maintain their value.

Local naturalists have a considerable part to play in conjunction with the Nature Conservancy in conserving the remaining areas of scientific interest. There is no substitute for the detailed knowledge of the local naturalist and the Conservancy will continue to ask for information on S.S.S.I.s, when matters such as development applications are referred to them. As the local naturalists are indispensable it falls to them to assist the cause of nature conservation by keeping up-to-date records of the scientific interest of S.S.S.I.s. Successful nature conservation does not cease with the scheduling of an area as a Site of Special Scientific Interest, but calls for continuing effort.

The following selection of cases indicate that nature conservation in the London area has had both setbacks and successes.

BUCKINGHAMSHIRE

PURSER'S PIT, RICHINGS PARK, IVER. TQ(51)030797

This last remaining pit exposing the "Iver Stage" of the Thames Terrace Gravels, of Hoxnian (Great) Interglacial age (Pleistocene) has been recommended for notification as an S.S.S.I.

It replaces the Mansion Lane (= Lavender's) Pit which had to be abandoned because the scientific interest was found to have been removed by quarrying.

It exposes brickearth with Late and Middle Levallois artifacts overlying the gravels with derived flint artifacts of several types.

These deposits rest upon London Clay.

ESSEX

ONGAR PARK WOOD. TL(52)4802.

This has been considerably reduced in size as a result of its conversion to agricultural land: the boundary of this S.S.S.I. will accordingly need to be revised.

GLOBE PIT, LITTLE THURROCK. TQ(51)625783.

A small site in the old Globe Chalk Pit has been recommended for notification as a Site of Special Scientific Interest.

It exposes a fragment of fluvial gravel which is part of the "Boyn Hill Terrace" of Hoxnian (Great) Interglacial Age (Pleistocene) containing an abundance of flakes of the Clacton flint industry. At the base of part of the section is exposed a bed with *Corbicula*. These deposits rest upon Thanet Sand.

KENT

SWANSCOMBE SKULL SITE NATIONAL NATURE RESERVE. TQ(51)598743.

Research here has suffered a setback by the death last year of Mr. B. O. Wymer, but his team's investigations of the Middle Gravel have been almost completed.

Mr. John Wymer is now undertaking a thorough investigation of the Lower Gravels.

MIDDLESEX

On May 6, 1959, the Urban District Council of Ruislip-Northwood declared part of RUISLIP RESERVOIR SU(41)0890 as a Local Nature Reserve, the first such Reserve to be declared in the South of England. The Ruislip and District Natural History Society are managing the area for the Council.

The Conservancy were represented at a Public Inquiry held on June 18, 1958, into an application for the erection of an asphalt and tarmacadam plant on part of STAINES MOOR S.S.S.I. TQ(51)0372. The Minister has allowed part of this development. As a result of this and other changes, this S.S.S.I. requires drastic boundary revision.

SURREY

Before the Black Pond, ESHER COMMON TQ(51)1362 was recently cleaned out, the Conservancy were consulted so that the biological interest should not be unduly damaged. The Pond was drained to facilitate silt removal, the drainage being carried out in the winter of 1959/60. The Conservancy asked that the better samples of vegetation

should be disturbed as little as possible and that the silt should be placed to avoid the more interesting adjacent areas.

The area of BOOKHAM COMMON TQ(51)1356 studied by the L.N.H.S. is listed to be scheduled as an S.S.S.I. at the next County revision. The Conservancy have made contact with the Bookham Common Committee of the National Trust, as a result of which the Conservation Corps of the Council for Nature have started on the clearance of part of the scrub.

FETCHAM MILL POND AND SPRINGS, NEAR LEATHERHEAD. TQ(51)158562.

Although changes here are imminent due to utilization of the large springs to augment the town water supply, what should prove to be satisfactory arrangements have been made to safeguard the scientific interest of both the remarkable spring pits (see *Lond. Nat.*, 36, 101, 1957) and the biological interest of the pond.

Official Reports for 1959

Curator's Report

The botanists and ecologists have added an excellent collection of phanerogams from Bookham Common to the herbarium.

A small number of Hymenoptera, including sawflies and Aculeata, and a collection of over 400 beetles have been added to the collections this year.

The Ornithological Section has been presented with a fine collection of over 2,800 eggs housed in four cabinets. Most are of species on the British List although numbers are from foreign localities. They have been catalogued, and represent about 190 species of which fifteen are new to our collection.

Skins are again being used regularly at Informal meetings, and discussions on the identification of confusing species have been both well attended and instructive.

Should any members find dead birds in good condition I should very much like them to contact me as we are in need of fresh skins to replace numbers of badly-worn ones.

Several new members have visited Eccleston Square during the year and have been impressed by the extent of our collections; but all curators would like to see more use made of our material, especially on Library and Collections evenings.

R. H. HYATT, *Curator.*

Librarian's Report

The attendance at the Library has shown a slight decrease: 150 compared with 159 in the previous year, though there was an increase in the number of books borrowed from 203 to 290.

The Library Committee has been reconstituted and now consists of the Sectional Librarians with Mr. R. W. Hale as Chairman. Mr. A. Le Gros has been appointed Exchange List Secretary.

The Committee would like to call the attention of members to the vast amount of information on all branches of Natural History available in the thousands of books and publications in the Library, and hope that more use will be made of it by members.

Some 259 new books, pamphlets and publications have been added to the Library during the year and Sectional Committees will be glad to consider requests from members for new books.

In conclusion I should like to thank the Sectional Librarians and members of the Library Rota for their work in the library and at the fortnightly meetings.

J. B. FOSTER, *Librarian.*

Nature Conservation

Since the end of 1956, Nature Conservation has been the responsibility of the Ecology Section, the County Representatives continuing to constitute the Conservation Committee, but of the Section and not of the Council. The general apathy of members to nature conservation continues, and as by 1959 the posts of Chairman and Secretary still remained unfilled, this unsatisfactory state of affairs was brought to Council's attention at its September meeting. Dr. G. Beven and Mr. C. P. Castell were then appointed Chairman and Secretary respectively and the Conservation Committee reconstituted as a Committee of Council.

An important development in the last year or two has been the formation of Naturalists' Trusts in the Home Counties. So far, those for Buckinghamshire, Essex, Kent and Surrey have been formed—the addresses of their Secretaries will be found at the end of this report. As these Trusts are, or soon will be, limited companies, the Society cannot be a member but can pay the subscription for an appointed representative member. This has been arranged for the Surrey Naturalists' Trust and it is to be hoped that similar support will be given to the other Trusts and co-operation arranged with them. Members are urged to join and take an active individual interest in the Trusts.

With regard to threats to sites within the Society's area, there is little to report, except for Surrey, where Mr. John Clegg, the Secretary of the Trust, has been most helpful.

PETERSHAM COMMON. During the summer of 1959 a member drew the Society's attention to a threat to Petersham Common. Although small, the common is one of the few remaining examples of semi-natural oak-wood in the London Area. A large proportion of the finest trees had been scheduled by the Conservators for felling, some had already been felled and 38 more were due for felling in the winter. All low boughs up to 10 feet from the ground were being trimmed and the ground vegetation periodically cut down to a few inches. Mr. Castell visited the common in August and formed the opinion that felling, in most cases, seemed a very drastic alternative to the removal of a few dead boughs.

Despite the views of the Richmond Society and of local naturalists, the Conservators "had adopted a five-year plan, which they hoped would preserve the woodland character of the common." They had reached the third stage, which included the felling of 38 trees, and were apparently anxious "to avoid doing anything which would prejudice the scientific value of the common." Against strong representations from the Surrey Naturalists' Trust, The Nature Conservancy, and our Society, a critical report by Sir William Taylor through the Richmond Society and letters in *The Richmond and Twickenham Times*, the third stage of felling to "preserve the woodland character" was carried out. After this, however, the Conservators asked the Surrey Naturalists' Trust for suggestions for management, which were drawn up in consultation with this Society and these were agreed to in principle by the Conservators at their meeting on December 31. In a letter to the Society's Conservation Secretary, the Conservators state that "a less drastic policy will be adopted

with regard to the trees, there will be no scything, except near roads, for a period of two years " and no exotic species will be introduced. Perhaps, in future, the advice of a naturalist familiar with the ecology of native woodlands might be sought, rather than the Parks Superintendent, and it would be an advantage to have such a naturalist among the Conservators. Petersham could then set an enlightened example to similar bodies in the London Area.

FETCHAM MILL POND. This pond was scheduled by the Nature Conservancy as a Site of Special Scientific Interest. It is " a stretch of water fed from below by 'spring pits' of unique character; with its adjoining fields and watercress beds, it is a haunt of many waterfowl and has several aquatic plants rare in Surrey." When, in 1958, Mr. E. W. Groves, the Conservation Representative for Surrey, learned that the East Surrey Water Company had acquired the pond, he expressed his concern to the Nature Conservancy, as it was clear that water abstraction could be the only reason. Unfortunately, in cases such as this, the Conservancy can take no action over a mere change of ownership and can do nothing until consulted by the local planning authority when development is proposed. Their action is then limited to giving scientific advice to the owners and to the planning authority, who can ignore it. Owing to the recent rapid increase of population in the Leatherhead district, the water company was faced with water shortage and Fetcham Mill Pond offered an abundant, convenient and cheap supply of unpolluted water. The company proposed to fill in the pond, to enclose the springs in concrete and to grass over the surface. An agreement was reached finally, early in January, 1960, thanks to the Nature Conservancy and the Leatherhead Urban Council, who negotiated independently with the water company. The spring-pits will be covered, grassed over and fenced, but not otherwise damaged; artificial lighting and an inspection manhole will be provided for bona-fide visitors; the bottom of the pond will be repuddled and kept full of water; excess water from the springs will be fed into the pond through the bottom so as to simulate one of the springs, it being hoped in this way to preserve the Marestail and to keep the Little Grebe. Unfortunately the watercress beds will have to be abandoned and may be taken over as a public open space. Although these results are much more satisfactory than at first thought possible, several features in the history of the case are open to criticism. On being informed by the Conservancy of the water company's original proposal, the Conservation Secretary urged the utmost opposition to the scheme; opposition was also expressed by the Leatherhead Urban Council and by the Surrey Naturalists' Trust, but nothing more was heard from the Conservancy except an assurance that talks were going on. After a public meeting on the subject had been held at Fetcham in December, the Conservation Secretary was put in touch by one of our members with Mr. H. J. Killick, a member of the Leatherhead Council's Planning Committee. Mr. Killick was supplied with details of the scientific interest of the pond. It appeared that the Committee had been quite unaware of the scheduling of the pond by the Nature Conservancy, although the Conservancy had notified the County Council. Our thanks are due to the Committee, and especially to Mr. Killick for their energetic last minute efforts, resulting in planning consent being given subject to conditions ensuring the preservation of as much as possible of the scientific interest of the pond and springs. Considerable modifications of the company's plans had been secured by the Nature

Conservancy in direct discussion with the company, but it was unfortunate that the Conservancy did not consider it necessary in this case to collaborate at the more humble level of this Society, the Surrey Naturalists' Trust and the Leatherhead Council.

BLACK POND, ESHER. The Surrey Naturalists' Trust investigated a scheme for the drainage of this pond. It was pointed out by the local engineer that drainage was necessary for the clearing of the pond, which was getting badly silted up and overgrown. It was arranged that a small piece of reed bed at the inlet would be retained in its present condition.

BOOKHAM COMMON. The Nature Conservancy's Proposal to schedule this common as a Site of Special Scientific Interest and the activities of the Conservation Corps in scrub clearance are reported under the Bookham Common Survey on p. 63.

It will be seen that the newly formed Surrey Naturalists' Trust has been active not only in the more rural parts of Surrey, and it has co-operated most effectively in the Society's Area.

C.P.C.

NATURALISTS' TRUSTS IN THE HOME COUNTIES

Addresses of Secretaries

Buckinghamshire: Mrs. S. Cowdy, The Lee, Great Missenden, Bucks.

Essex: T. H. Bartrop, Oak Tree Cottage, Margaretting, Ingatestone, Essex.

Kent: A. Fletcher, 2 York Road, Rochester, Kent.

Surrey: John Clegg, Educational Museum, Haslemere, Surrey.

The Council for Nature

The Council for Nature, of which our Society is a founder member, celebrated its first birthday in July, 1959, and by the end of that year had much progress to report.

The Council for Nature is a voluntary association of societies and other organizations constituted in the United Kingdom which are interested in the conservation of nature and the study of natural history. It is established with the following aims:

i. To constitute itself a central consultative body linking amateur, specialist and popular interest in natural history and nature conservation; to provide a standing advisory service, in respect of these subjects, available to its member bodies and others.

ii. On appropriate occasions to organize public opinion and to make representations to Local Authorities and Government Departments, and if necessary to Parliament, in respect of any matters properly the concern of the Council or its member bodies.

iii. To promote the establishment of local and regional natural history societies, naturalists' trusts and nature reserves.

iv. To assist the work and development of member bodies.

v. Generally to arouse and stimulate public interest and to educate public opinion in natural history and in the need for the conservation of nature and natural resources.

At the end of 1959, membership stood at 202, of which 39 were national and 163 regional or local societies. Member societies were estimated to have well over 30,000 individual members.

Membership is restricted to corporate bodies and in view of the fact that most natural history societies have very slender financial resources,

it was decided to fix the minimum annual subscription at £1 for societies. Subscriptions from member societies can provide but a small fraction of the income needed to enable the Council to carry out its work and it is hoped that the Council will be supported by donations and grants. Individuals supporting the Council by making an annual payment under covenant of £5 are welcome as Associates and those giving annually amounts less than £5 as Subscribers.

Two committees have been set up—a Conservation and a Services to Societies Committee.

THE CONSERVATION COMMITTEE. The Council for Nature opposed the Central Electricity Generating Board's application for permission to build a nuclear power station at Dungeness. As a result of the failure of the opposition, a resolution was passed at the 1959 Annual General Meeting expressing concern at the threats to the remaining undeveloped areas of the country's coastline by industrial and other developments and calling for a halt in the process of spoliation. The Nature Conservancy was urged to convene a meeting of the national interested bodies at an early date. The first meeting was attended by representatives of the Nature Conservancy, the Council for Nature, the National Parks Commission and the Council for the Preservation of Rural England and was held on November 12. At a further meeting, the problem of the preservation of the many unspoilt stretches of coastline as a whole, as well as the siting of future atomic power stations, will be discussed.

The attention of the Government has been drawn to the danger of toxic sprays to wildlife, and early in 1960 a meeting is being organized by the Council at which the problem will be discussed between representatives of national organizations and agricultural scientists.

One of the most important of the Council's activities has been the establishment of the Conservation Corps, with the help of a generous grant from the Carnegie United Kingdom Trust. The Conservation Corps works on sites of particular interest to naturalists, undertaking such work as scrub clearance, path making, ditching and general improvement at week-ends or for periods of one or two weeks. In return, the Council pays for accommodation and helps towards the fares, and the volunteers receive training in practical conservation and lectures on natural history topics. In the Society's area, the Corps has worked at Boxhill, clearing dogwood scrub from the chalk grassland, at the Selborne Society's Bird Sanctuary at Perivale and at scrub clearance at Bookham Common.

SERVICES TO SOCIETIES. The activities of this committee have included the circulation of five duplicated "News Letters" to the Officers of societies, the provision of information on grants in aid of publication, advice on the conditions under which a society may be able to recover income tax on subscriptions paid under covenant and the printing of 15,000 copies of a 16-page booklet "News for Naturalists." This booklet, intended for wide distribution among naturalists, was issued free and sent in bulk to societies for distribution to their members. Two numbers were issued in 1959 and about 200 copies of each were made available to our members at indoor meetings: more could be distributed if wanted.

A responsibility of the Services to Societies Committee is the Intelligence Unit, established and maintained by the help of a substantial grant by the B.B.C. The Unit will collect and index information on the work

being undertaken by societies, groups and individuals in the whole field of natural history and conservation. With the information thus collected, the Council for Nature will be in a position to help societies, individual naturalists, the press, the B.B.C., Independent Television and any other bodies wishing to have information on natural history matters. Our member Mr. R. S. R. Fitter has been appointed Director of the Intelligence Unit. He will be assisted by Mr. Stanley Jeeves as Films Officer and by other members of staff. It is hoped that Mr. Jeeves will be able to help with advice, and perhaps instruction, societies and individuals wishing to make natural history films. He will also be responsible for preparing lists of films which can be borrowed by societies for showing to their members. The existence of the Intelligence Unit should be of considerable assistance to individuals or bodies wishing to plan investigations and will, it is hoped, provide a useful stimulus to the natural history movement.

Lord Hurcomb, an old member and friend of our Society is President of the Council for Nature, and the Hon. Secretary is the Chairman of our Botany Section, Mr. J. E. Lousley. Mr. C. P. Castell and Mrs. L. M. P. Small are members of the Executive Committee, while Mr. Castell, Dr. J. L. Cloudsley-Thompson and Mr. J. D. Hillaby serve on the Services to Societies Committee.

It will be seen that members of our Society are taking an active part in the affairs of the Council for Nature, which has made such an auspicious start.

C.P.C.

Statement of Accounts

GENERAL

1958			Receipts						GENERAL		
£	s.	d.	£	s.	d.	£	s.	d.	£	s.	d.
1.293	5	9	Subscriptions Current	...	...	1,695	8	0			
14	12	6	Subscriptions Arrears	...	...	34	14	0			
46	7	6	Subscriptions Advance	...	...	26	17	6			
66	0	0	Entrance Fees	...	...	48	15	0			
<hr/>											
1,420	5	9							1,805	14	6
176	11	10	President's Fund	...	...	...	...	...	14	3	6
1	7	11	Interest—P.O. Account	...	...	...	...	...	—	—	—
2	12	6	Interest—£75 3½% War Stock	...	...	...	...	...	2	12	6
5	8	0	Interest—£180 3% Savings Bonds	...	...	...	...	...	5	8	0
24	19	5	Interest—Deposit Account	...	...	...	...	...	15	15	3
5	2	0	Rents	...	...	...	...	...	6	18	0
6	3		Sundries	...	...	...	...	...	—	—	—
106	10	0	Centenary Film Show	...	...	...	...	...	—	—	—
7	1	6	Trans. from Christmas Card Account	...	...	...	...	...	59	10	6
31	13	0	Balance in hand 31.10.57	...	...	...	...	...	—	—	—
146	6	7	Deficit 31.10.58	...	...	...	...	...	—	—	—
<hr/>											
£1,928	4	9							£1,910	2	3
<hr/>											

PUBLICATIONS

86	7	8	Sales of Publications	...	...	...	...	...	67	1	7
50	0	0	Grant from Royal Society	...	...	...	...	...	—	—	—
2	2	0	Advertisements	...	...	...	...	...	10	0	0
93	7	6	Trans. from Legacy Account	...	...	...	...	...	—	—	—
			Res. <i>L.B.R.</i> No. 22 and postage	...	275	0	0				
			Cost <i>L.B.R.</i> No. 22 and postage	...	228	16	9				
<hr/>									46	3	3
1,011	1	9	Trans. from General Account	...	...	...	...	...	751	4	5
<hr/>									£874	9	3
<hr/>											

CHRISTMAS CARD

47	16	11	Sales—November and December 1958	...	...	60	13	8
9	6	4	Sales—September and October 1959	...	...	4	12	6
<hr/>								
£57	3	3						
<hr/>								
						£65	6	2
<hr/>								

A. W. JONES, *Hon. Auditor.*

H. B. CAMPLIN, *Hon. Auditor.*

V. F. HANCOCK, *Hon. Treasurer.*

Year Ending October 31, 1959

ACCOUNT

1958	Payments			
		£	s.	d.
164 15 0	Hire of rooms and halls with gratuities	...	...	162 2 6
78 5 3	25 Eccleston Square, Rent and Upkeep	...	...	63 2 7
26 15 9	Library and collections	...	...	26 19 6
84 4 10	Printing and Stationery	...	...	84 15 6
150 16 7	General Secretary's Honorarium and Expenses	...	...	192 5 0
27 5 1	General Secretary's Telephone	...	...	28 12 3
52 10 10	General Secretary's Postages	...	...	44 12 6
5 5 6	Insurance	...	...	6 18 9
19 3 0	Subscriptions to other Societies	...	...	14 3 0
70 3 9	Sectional and Group Grants	...	...	79 10 0
7 0 3	Sundries	...	...	22 13 7
101 16 6	Centenary Film Show	...	...	— — —
136 18 2	Centenary Exhibition	...	...	79 10 3
— — —	Film for "Birds of London"	...	...	42 16 8
1,011 1 9	Grant to Publications Account	...	...	751 4 5
— — —	Trans. to Reserve Account	...	...	100 0 0
— — —	Deficit 31.10.58	...	...	146 6 7
— — —	Balance in hand 31.10.59	...	...	64 9 2
 <hr/>	 <hr/>	 <hr/>	 <hr/>	 <hr/>
£1,928 4 9				£1,910 2 3
 <hr/>	 <hr/>	 <hr/>	 <hr/>	 <hr/>

ACCOUNT

166 10 0	Programme	...	...	...	...	118 0 0
672 1 2	<i>London Naturalist</i> No. 38	...	...	...	...	445 15 2
— — —	<i>L.B.R.</i> No. 23 Blocks	...	...	...	...	10 6 5
20 0 3	Addressing and Wrapping	...	...	...	...	19 13 6
75 4 9	Postages	...	...	...	...	50 14 2
275 0 0	Reserve for <i>L.B.R.</i> No. 23	...	...	...	...	230 0 0
34 2 9	<i>L.B.R.</i> No. 21 cost less reserve	...	...	...	...	— — —
 <hr/>	 <hr/>	 <hr/>	 <hr/>	 <hr/>	 <hr/>	 <hr/>
£1,242 18 11						£874 9 3
 <hr/>	 <hr/>	 <hr/>	 <hr/>	 <hr/>	 <hr/>	 <hr/>

ACCOUNT

16 3 5	Printing 1958	...	...	...	39 14 0
	<i>Less Reserve</i>	...	...	...	33 18 4
					<hr/>
33 18 4	Reserve 1959	...	...	...	5 15 8
7 1 6	To General Account	...	...	...	<hr/>
 <hr/>	 <hr/>	 <hr/>	 <hr/>	 <hr/>	 <hr/>
£57 3 3					£65 6 2
 <hr/>	 <hr/>	 <hr/>	 <hr/>	 <hr/>	 <hr/>

The Life Composition Account remains at £400 whilst the Reserve Account was increased from £75 to £175 by a transfer of £100 from General Account. The detailed accounts of the sections have not been examined.

Sectional Reports

Archaeological Section

During the year the Section has continued to flourish and to consolidate its position, with a growing number of members working on Roman road research.

Field meetings covering a wide range of subjects have all been well attended. Visits have been made to the exposed section of Roman road at Holtie and to the near-by Dry Hill Iron Age Camp, to Farthing Down, Coulsdon, where Mr. Turner explained the Celtic field system, and to Westminster Abbey Library, where Manuscripts, Abbey rolls and Royal relics were shown to members by Mr. Tanner. From the top of Canongate Tower the party had a good view of N.E. London and learnt something of the present use and history of this late 16th century building. In July a pleasant Saturday afternoon was spent at Lullingstone where Col. Meates described the excavations and finds at the Roman Villa. In October, the history and story of restoration after war damage of St. Mary Abchurch was told and shown to members by Mr. Eric Smith.

Mr. Hales' informal talk on Heraldry was a good introduction to this subject, just before a visit to the College of Arms: there members saw records of some of the earliest and recent grants of Arms.

There were two lectures on aspects of London during Roman times: Mr. Norman Cook dealt with the City origin, its walls and gate-ways, and Mr. C. W. Phillips spoke about the roads around London. Miss Darlington gave a well-illustrated talk on old maps of the area.

Turning to other activities of the Section, groups are at work on the problems of the Roman road systems in the London area. One group led by Mr. Bignell has found much new evidence for the course of the road from London towards Dunmow. It is hoped this may soon be tested by excavation. Miss Darlington's group has been studying the difficult problem of the line of Watling Street from Greenwich to Southwark.

Two excavations have been carried out at Morden to test the course of Stane Street (See Mr. Turner's paper on page 130). In October and November some members helped Mr. P. Marsden of the Guildhall Museum with the excavation of part of a Roman boat in Southwark.

Soon after the last A.G.M. Miss Scholey, Librarian, and Miss Welford, Reading-Circle Secretary, resigned. Miss S. Tuck and Mrs. Bignell kindly agreed to take on these offices. We wish to thank the retiring members for all their work during the years for the Section. Finally the Committee wish to thank Mr. Hale for all his help and encouragement during two years as Chairman of the Section.

ELIZABETH WILSON, *Secretary.*

Botanical Section

The activities of the Section have been fully maintained during the year, and well supported; attendances at the meetings (both indoor and outdoor) having been at least equal to those of previous years.

Of the lectures, those by Miss P. J. Edwards on "Plants and Animals in Colour" and by Mr. T. G. Collett on "Wild Flowers through the Year" were illustrated by colour slides of outstanding quality. The account of the setting-up of the Scott Head exhibit in the new botanical gallery at the British Museum (Natural History), given by Messrs. H. R. Allen and

J. F. M. Cannon was of great interest; while the lecture by Dr. D. P. Young on *Epipactis* was of special value to our more advanced members. The informal meetings at Eccleston Square included a most helpful evening on the identification of yellow composites, led by Mr. J. B. Marshall.

The field meeting arranged by the Haslemere Natural History Society in July deserves special mention. Our members met at Haslemere Station and were transported by cars to Thursley Common to examine the flora of the finest series of bogs in Surrey. On the return to Haslemere, tea was provided by our hosts, and members were able to inspect the museum and its grounds.

This year has seen the conclusion of the first phase of the recording for the B.S.B.I. Distribution Maps Scheme. The areas for which the Section has been responsible have now been explored as thoroughly as our resources permit, and the completed cards have been sent to the headquarters of the Survey at Cambridge. Dr. Perring, the present Director, has expressed his satisfaction with the Society's contribution.

It is of interest to note that further work on certain critical genera is being planned by the B.S.B.I., and your committee are in close touch with the organizers to ensure the maximum of co-operation in this matter.

With reference to the Society's own records, we have now been able to add Lichens to the other groups for which London area records are collected. Mr. Peterken has undertaken the work of recording, and would welcome the assistance of as many members as possible in collecting and observing. It is hoped that a Handlist of Bryophytes and Lichens will be published in the not-too-distant future.

Interest has been shown by several of our members in the large trees of the inner London area. It has been suggested that some of these are of historical value, and that others might well be recorded for their size, or intrinsic beauty. In the latter respect the Society is indebted to Mr. K. Lilley for an album of excellent tree photographs. The donor has expressed the hope that others will be interested, and add to the collection in due course.

The end of this year has brought considerable changes in the personnel of your officers and committee. Mr. P. C. Holland has succeeded Mr. F. E. Wrighton as Sectional Secretary and Reading-Circle Secretary, and Miss E. M. C. Isherwood has taken the position of Programme Secretary following the retirement of Miss G. W. Dalby. Mr. and Mrs. P. C. Hall have resigned from the Committee and the following members have been elected to serve: Miss D. W. Fawdry, Miss M. E. Kennedy, Mrs. A. G. Side and Mr. D. N. Turner. The Section would wish to welcome these new officers and committee members, and to thank those retiring for their past services.

J. E. LOUSLEY, *Chairman.* F. E. WRIGHTON, *Secretary.*

Ecological Section

The Bookham Common Survey continues and although the number of active workers is now very small, much interesting information is still being collected. More helpers are urgently needed for these investigations as there is a great deal of work still to be done on the ecology of Bookham. Interest in the Common may be increased in the near future. The Nature Conservancy has for some time been concerned about the development of scrub on our commons and downlands due to lack of grazing over the last

50 years or so. Bookham is a typical example of such change and because the Common has been so "well documented" the Nature Conservancy, in conjunction with the National Trust, is considering doing experimental work on clearing some of the overgrown plains and other measures which might help to preserve the Common.

Monthly meetings were also held at Devilsden Wood but, because of the low attendance of members, the survey was discontinued in August. Visits were also made to Wormley Wood and the Horsley area.

Dr. H. B. D. Kettlewell gave a lecture during the year on "Industrial Melanism and Natural Selection by Birds" and Miss J. M. Laptain of the Nature Conservancy on "Nature Reserves." An evening was also devoted to short talks by members on their own recent work, covering "A Sand-heath in Finnish Lapland" by E. W. Groves, "The Headley Heath Survey" by C. P. Castell, "Lichens of London" by J. R. Laundon, and "Aquatic and Wasteland Plants of Bookham Common," by A. W. Jones.

The Mammal Study Group held two indoor meetings, one on "The Coypu" by R. A. Davies and the other entitled "Buzzards and Barrows (Mammals in Prehistory)" by Dr. Peter Jewell. Informal meetings to discuss "Hedgehogs," "Deer," "Shrews" and "Small Mammals in Captivity" were well attended. Miss M. Pugh led a field meeting at Havering-atte-Bower. Surveys into the distribution of the Hedgehog in the London Area, the analysis of bird pellets for mammal remains and the recording of mammals, reptiles and amphibians, were continued.

G. BEVEN, *Chairman.* A. W. JONES, *Secretary.*

Entomological Section

Because there are so many branches of entomology this Section is faced with the difficult task of trying to please all its members as often as possible. The result is that some meetings are better attended than others and as many as 60 were present for Dr. Hicken's fascinating talk on "An Entomologist's Safari through Central Africa." There was regrettably a continued drop in the number of exhibits at the indoor meetings throughout the year and the September exhibits meeting was the most disappointing for several years. Exhibits should form a feature of our meetings and it is hoped that more will be forthcoming in the future.

Other lectures given during the year were:—Dr. E. R. Nye on "Mosquitoes and Disease Transmission" and "Breeding Places of Mansonoides Mosquitoes" by Dr. B. R. Laurence; B. L. J. Byerley's film "Perthshire Perambulations and Ross-shire Rovings"; J. F. Shillito on "A Diversity of Diptera"; D. J. Clark on "Spiders—Fact and Fiction"; Dr. E. Duffey on "Ascension Island"; and a further set of slides by Mr. Byerley depicting "Insect Portraits."

Emphasis was placed on the needs of beginners at the discussions held at informal meetings and the subjects dealt with included "Starting to Study the Hemiptera-Heteroptera" by E. W. Groves; "Methods of Killing Insects" introduced by B. L. J. Byerley; "Starting to Study Flies (Diptera)" introduced by L. Parmenter; "Field Equipment for Entomologists" by K. H. Hyatt; and a discussion on the Society's entomological collections. In this connection plans are being made to lay out one cabinet as an introduction to the study of insects.

For the first time for very many years, all the field meetings were held in glorious, hot, sunny weather and most were well attended. The dry

conditions, however, made the search for insects increasingly difficult as the summer lingered on. Localities visited included Bookham Common, Box Hill, Brentwood, Chobham Common, Coulsdon, Farningham, High Halstow, Horsley, Mickleham, Sunningdale and Westerham. The High Halstow meeting may be singled out for special mention as members had the good fortune in finding the local beetles *Demetrias imperialis* Germar and *Anthocomus rufus* Herbst. These two species were formerly confined to the fen districts but now seem to be more widely distributed. Two local grasshoppers *Metrioptera roeseli* Hagenbach and *Conocephalus dorsalis* Latr. were also seen.

The Committee for the Protection of British Insects of the Royal Entomological Society was dissolved during the year and a new Conservation Committee with wider scope set up in its place. As a result of this re-organization, the Society ceased to be represented on the new Committee. Our thanks are extended to Mr. E. W. Groves for his services as our representative on the former Protection Committee since 1955.

During the year it was decided to carry out a survey of the distribution of the Stag Beetle (*Lucanus cervus* L.) within the Society's area. Early reports indicated either that the species is declining in numbers or that the weather conditions may have been unsuitable for the beetle. Further records in 1960 and subsequent years will no doubt help us to obtain a clearer picture of the status of this fine insect.

Following the success of "The Moths of the London Area" steps are being taken to follow this up in due course with a series on the micro-lepidoptera. As a first step it has been decided to appoint Mr. D. Ollevant as recorder for these insects.

There was a slight drop in membership during the year, probably due to the increase in subscriptions, and the figure now stands at 311.

Last year Mr. Parmenter gave up the secretaryship and this year we lose the services and guidance of the Baron C. G. M. de Worms who has been our Chairman for the past nine years.

C. G. M. DE WORMS, *Chairman*. D. G. HALL, *Secretary*.

Epping Forest Field Section

As the average attendance at the field meetings this year was 18, it seems that there is once again a great demand for field meetings in the area of north-east London. Throughout the year there have been an average of two field meetings a month and whilst, by request, a number of these have been ornithological, there have also been excursions for herpetology, entomology, archaeology, geology and botany including bryophytes, ferns and fungi in Epping Forest.

We are greatly indebted to the experts who have come forward to lead these meetings and we wish to thank them for the help that they have given the Section.

The only indoor meeting was the A.G.M. at which Mr. A. Leutscher gave an interesting and amusing talk on the various pets that he keeps at home, including reptiles and amphibia, a bush baby and a slow loris. Mr. Geoffrey Kinns took the colour transparencies of this odd collection, the settings for the photographs being particularly beautiful.

J. JONES, *Secretary*.

Geological Section

The paradox of an increasing membership resulting in a declining attendance at field meetings has been the experience of the Section during

the year. Out-door activities best supported were those of a general geological interest, whilst support for the more specialist pursuits seemed disappointing. There appears to be a desire from members for more meetings of a kind that relate geology to other branches of natural history and geography. The existence of a geological section within the London Natural History Society could provide much scope for the holding of joint meetings for this purpose to the definite advantage of the naturalist. It is the intention in the future to explore the possibility of more meetings that could be held jointly.

Altogether some 20 meetings were held. For the fifth consecutive year there was an Easter field meeting. At this Mr. R. E. Butler and Mr. R. F. Moorman were the leaders in a full programme on the Isle of Wight. Among important localities visited were Bouldnor for the Hamstead Beds, Colwell Bay for Oligocene strata and Ventnor Station yard where the Lower Chalk is exceptionally fossiliferous. These three localities had not been previously visited by the Section. A coach was hired for two of the days to enable the 22 members of the party to see most of the classic coastal sections.

The remarkably dry weather of the summer months was well illustrated in a September visit to the swallow holes at North Mimms. Swallow holes are striking features of chalk country. They were very well seen on this visit, their locations being easily found.

The one coach meeting of the year was with Dr. W. S. Pitcher to North Kent where classic sections at Upnor, Reculver and Pegwell Bay were examined. Among the several localities seen was the site where the famous "Chatham Elephant" was found. The assembled remains of this creature are now on exhibition at the Natural History Museum.

Among the programme of conducted visits to places of special interest was a curious but fascinating visit to the unique showrooms of Messrs. Gregory Bottley & Co., the mineralogists of Chelsea. A meeting dealing with decorative stones on another occasion took members to the National Gallery and Brompton Oratory.

A highlight of the indoor meeting programmes was a talk by Dr. W. S. Swinton entitled "The Birth of a Dinosaur." The title, as Dr. Swinton stated, had nothing to do with obstetrics but concerned the first discoveries of gigantic reptile remains found in Sussex by Dr. Gideon Mantell during the first half of the last century.

The informal meetings at Eccleston Square continue to be popular. A feature of the last one was a show of photographs. Arising from this there has been the decision to prepare two photograph albums. One of these will contain a record of important geological exposures within the Society's area whilst the other will be used to maintain a record of Easter Field meetings.

The thanks of the section are due to all those who have contributed to its activities during the year and to the owners of quarries who have in every instance readily given their permission for access to their properties.

R. E. BUTLER, *Chairman.* R. J. PARSONS, *Secretary.*

Ornithological Section

During the year Mr. D. D. Murray kindly undertook the considerable task of revising the Sectional membership card index and the results of his labours revealed that the Section's membership now tops the 1,100 mark !

To cater for our large membership a wide variety of subjects were covered at indoor meetings including Behaviour Studies, Studies of Individual Species, Ecological Studies and Observatory Work. Some excellent films of birds taken both at home and abroad were also shown and meetings were again held jointly with other Societies.

Our own members provided the material for some of the most successful meetings, and indeed at one of them some members had to be regretfully refused admission to an already overcrowded hall, since to have admitted them would have contravened the fire regulations !

The search for suitable larger meeting-halls continues and in October the Mahatma Gandhi Hall was used for the first time.

The Informal meetings held regularly every alternate month in the Library at Eccleston Square have again proved to be an excellent way of dealing with such subjects as Field Photography, Identification Problems and Bird Books in a more intimate fashion than would be possible at the larger meetings.

The varied indoor programme was matched outdoors by the 51 field meetings held during the year, attended on average by 30 members. Whilst most of the meetings were held within the Society's area six coach trips outside the area were made, the furthest being to the Wildfowl Trust at Slimbridge.

The ringing activities of the Section were discussed at an Informal meeting in March and a well organized week-end ringing course for members was held at Dungeness Bird Observatory in October, when 202 birds of 24 species were ringed, giving valuable training experience for beginners on the party. The Section made a grant this year to our Ringing Station at Beddington to support the continuing excellent work there of Mr. Milne and his team.

The 1957 *L.B.R.* published in November, 1958, was of the customary high standard but our other publication, *The Bulletin*, under the continued editorship of Mr. Cordero, although always excellent and topical in content, did not receive the support it well deserves as only a fifth of the Section's membership are on the circulation list.

Several other services provided by the Section were also poorly supported. Only 78 books were borrowed from the library during the year although a new library list has been issued and further additions made to the library.

Similarly insufficient use was made of the egg and skin collection although important additions were made to the collection during the year, and their value was demonstrated by the fact that several speakers at Informal meetings used skins from the collection to illustrate their talks.

There was also a slight falling-off in membership of the Reading-Circles this year. Your Committee was concerned that the services provided did not receive better support and it hoped that, with greater publicity, far more members will use the facilities available.

Following the provision of a grant by Council for the making of the full length colour film of bird life in the Society's area, filming began in earnest this year and the camera men—Raymond Cordero and Bill Park—have already taken several hundred feet of film. The purpose of the film is primarily to provide an historical record of the birds and the various types of habitat in the Society's area. Such a film, however, will also have a considerable publicity and educational value and public showings should mean eventual recovery of our expenditure.

It was decided that we should, in common with other Sections, retain and refurbish for future use some of the excellent panels prepared for the Centenary Exhibition.

The customary annual financial grant was again made by the Section to the Dungeness Bird Observatory, the management of which is partly the responsibility of our Society. The Observatory has been without the services of a full time warden this year and several members of the Section gave valuable assistance by acting as temporary wardens for varying periods.

Members will already know from the report in last year's *London Naturalist* that the Society now has the exclusive use of a 21-acre wood at Claygate as a sanctuary and study and survey centre. A small reconnaissance party made a preliminary investigation of the wood during the year and further and more thorough forays are planned for the near future to ascertain the possibilities for serious Sectional work there.

During the year Mr. Eric Pilcher was appointed Minuting Secretary upon the resignation of Mrs. Adams who left because of the pressure of other work.

Mr. T. W. Gladwin was elected to the Committee at the 1959 A.G.M. and Mr. D. V. Freshwater kindly agreed to act as Sectional Auditor (a new post). Mrs. Roberts, Miss Hawkes and Miss Yeld took over the task of selling publications at indoor meetings from Miss Granter and Miss Pattison who jointly had managed the publications table for a considerable time. Miss P. M. B. Brown kindly covered the period between the resignation of the original sales team and the appointment of the new.

The Section suffered a considerable loss when both Mr. Medhurst and Mr. Parslow resigned upon moving out of the area. The loss of these two Officers meant that four important posts became vacant and the committee was fortunate in being able to fill them as follows:—

Chairman of the Records Committee: Mr. P. A. D. Hollom.

Editor of the *London Bird Report*: Mr. D. I. M. Wallace.

Recorder for South of the Thames: Mr. R. E. Scott.

Recorder for North of the Thames: Mr. P. R. Colston.

Our thanks are due to these members for undertaking these tasks at a critical period and to the other officials and Committee members for their unfailing help and support during the year.

L. BAKER, *Chairman*. W. D. PARK, *Secretary*.

Ramblers' Section

The membership of the Section remains fairly steady. Two evening meetings were allotted to us during the year: on May 26 Miss Christina Hole gave a most interesting talk on "Witchcraft," and on October 13 after our Sectional Annual General Meeting Mr. D. Kimmens showed us many beautiful coloured slides of scenery and wild flowers which he had taken on his "Scottish Field Holidays."

Thirteen excursions were held during the year, the Saturday and mid-week half-day events again proving to be more popular than the Sunday whole day ones. At Dr. Barnardo's Homes at Barkingside there was a good attendance in spite of the cold weather and the evening trip on the *Jason* to Greenford drew 48 members and friends. Places visited on the Sunday excursions were diverse and interesting and included Bayford, Saville Gardens and Windsor Park, Dunton Green, Oxted, Watford and

Haslemere. One in conjunction with the Andover and District Natural History Society took us as far afield as Stockbridge.

It is with very great regret that we have to record the death of Miss B. Deans-Brown who led us on many walks; the extreme care that she always took over the detailed planning of these made them most enjoyable; she was a Committee Member and until her untimely death held the post of Reading-Circle Secretary.

We should like to thank our retiring Chairman Mr. G. F. Lawrence for his services to the Section during the past three years; Miss D. Nutting has kindly consented to take over the post.

G. F. LAWRENCE, *Chairman.* L. J. JOHNS, *Secretary.*

South-West Middlesex Group

We are pleased to report that our paid-up Group Membership numbers remain fairly constant, the total membership being 88, made up of 70 full members and 18 junior members.

The result of the appeal by Officers and Group Committee for more interest to be taken in the running of the Group, does seem to have resulted in the attendance of more Group members at all meetings arranged by the Group. The Programme Secretary and Committee are to be congratulated on their efforts to make meetings attractive and members welcome.

Attendances at indoor meetings averaged 15, at outdoor meetings 11.

The excellent weather this year helped to provide many enjoyable field excursions. Worthy of mention was an evening with Mr. E. Milne-Redhead at Syon Park, when efforts were made to try and locate the roosting site of the Noctule Bats which frequent Kew Gardens. Only two were observed proceeding towards Kew from a westerly direction over Syon House; it was felt that some further observations from a more westerly point might be rewarding.

An excursion with Mr. H. J. Mackett to Blackwater Estuary by coach early in the year was very well worthwhile; in a favourable light some 1,000 Brent Geese were seen feeding at the water's edge, also many other waders. A Short Eared Owl was also seen on this occasion by a few members.

Although Mr. Pierce our entomology recorder has had less time for observation this year, 134 moths and 17 butterflies have been noted by him. The following moths were observed for the first time since the Group was formed in 1952:—

Dark Marbled Carpet *Dysstroma citrata*
 Common Fanfoot *Herminia barbalis*
 Buttoned Snout *Hypena rostralis*
 Clouded Buff *Diacrisia sannio*
 Bordered Beauty *Epione repandaria*
 Lesser Yellow Underwing *Triphoena comes*

We are indebted to Miss E. M. Goom for having noted the Pale Clouded Yellow butterfly, *Colias hyale* in Bushy Park, also a first record in this area. It is pleasing to note that the Speckled Wood colony in Syon Park is still flourishing. Our recorder was unable to visit Mogden Drainage Works at the right time in order to check the colony of Green Hairstreak (*Callophrys rubi*) previously established on broom.

The total number of Macro Lepidoptera in the Group records is now 270.

Fewer bird records were received than last year, and the only new species recorded was the Great Grey Shrike seen by three members on Staines Moor on May 23.

Our Group recorders once again appeal to members for reports on their observations in this area to be sent to them.

A. ANDERSON, *Chairman*. E. EVERITT, *Secretary*.

Young Naturalists' Section

In May, 1959, it was proposed that a section should be formed for young members, with its own Committee of young people. Permission was given and all members of the Society were notified by means of a form enclosed with the *London Naturalist*. More than 40 of these forms were returned to a temporary Secretary.

In October an informal meeting was held at Eccleston Square to discuss plans for the Section and the Library was crowded with naturalists, both young and old. A temporary Committee was formed, possible types of meetings were discussed, and members gave their views concerning the suggestion. Later this Committee held its first meeting and arranged the Section's immediate programme. It was suggested that a *Bulletin* should be issued, containing information about the various youthful activities in progress, and an Editor was appointed.

Two informal "Discussion" meetings were held, to which members brought mounted insects, plant photographs, note-books, drawings, a tapeworm from a Roach, pressed seaweeds, lichens and some live animals, including Green Toads, Bank Voles, a Wood Mouse and an Axolotl. Visits were made to Wimbledon Common (in thick fog !), Hampstead Heath and Richmond Park, whilst many more are planned, especially in connection with the Mammal Study Group's Badger and Fox Survey. Youth Hostelling week-ends are also a possibility.

Many older members of the Society offered their services as general naturalists, leaders of field trips and speakers at indoor meetings, and the new Section is connected with the Conservation Corps of the Council for Nature and with the International Youth Federation for the Study and Conservation of Nature. It should provide an introduction to the Society and all branches of Nature Study for new members and all young naturalists.

W. G. TEAGLE, *Chairman*. MURIEL PARK, *Secretary*.



LONDON NATURAL HISTORY SOCIETY PUBLICATIONS

(Terms: Cash with Order)

London Naturalist, 1921-56 (Nos. 1-36) 1s. 6d. each (1926-8, 1933, 1937 O.P.);
1957-8 (Nos. 37 and 38) 10s. each.
(Postage: 1 copy 1s.—each additional copy 6d.)

London Bird Report, 1936-56 (Nos. 1-21) 9d. each (1936-8, 1943 O.P.); 1957-8
(Nos. 22 and 23) 5s. each.
(Postage: 1 copy 9d.—each additional copy 4d.)

Transactions of the London Natural History Society, 1916-20, each 9d.
Map of the Society's Area, 9d. (Post free).

“LONDON NATURALIST” REPRINTS

Note.—Dates in brackets refer to issue of L.N. and are not dates of publication.
Nos. 21-108, 6d. each, except for *Hand List of Plants of the London Area* and
The Moths of London and Its Surroundings.

- 19, 21, 22, 23, 25, 30.** *Survey of Limpsfield Common*: 1939-1943.
- 24.** *Randolph William Robbins (1871-1941)*, (1941).
- 29, 33, 35, 44, 46, 51, 60, 67, 71, 75, 81, 87, 99.** *Survey of Bookham Common*:
1943-56; 117, 1957, 1s. 6d., 118, 1958, 2s. 6d., 121, 1959, 2s. 6d.
- 34, 36, 45, 47.** *Epping Forest Survey*: 1944-7.
- 34a.** *Docks and Sorrels of the London Area*, by J. E. Lousley (1944).
- 37.** *William Curtis (1748-1799)*, by J. E. Lousley (1945).
- 38.** *Neuroptera of the Home Counties*, by E. B. Pinniger (1945).
- 42.** *The Brambles of Middlesex*, by C. Avery and W. C. R. Watson (1946).
- 43.** *Coenagrion scitulum Rambur, a Dragonfly New to Britain*, by Edward B.
Pinniger (1946).
- 48.** *Hymenoptera Aculeata of Hampstead Heath* (with map), by K. M. Guichard
and I. H. H. Yarrow (1947).
- 49, 72, 76, 82, 88.** *City Bombed Sites Survey*: 1947-54.
- 55.** *The Story of our Society*, by L. G. Payne (Part I, 1947, Part II, 1948).
- 63, 69.** *Report on the Temporary Geological Sections* (1949); (1950).
- 64.** *Kent Plant Records*, by F. Rose (1949).
- 65.** *Hepaticas of the London Area*, by R. A. Boniface (1949).
- 66.** *Mammals, etc., of the London Area, Additional Records*, by R. S. R. Fitter
(1949).
- 70, 73, 77, 83, 90, 100, 104.** *Hand List of the Plants of the London Area*, by
D. H. Kent and J. E. Lousley, 1950-6, Parts I-VII, 3s. each, 20s. the set
(post free).

“LONDON NATURALIST” REPRINTS (Contd.)

92, 101. **The Flies of the London Area. II, Culicidae, sub-family Culicinae (Mosquitoes), with key to species of *Culex*, by E. R. Nye (1954); III, Trypetidae, by M. Niblett (1955).**

78. **Habitats of the London Area, by J. H. G. Peterken (1952).**

79. **Ecology and Distribution of the Satyridae in West Kent, by D. F. Owen (1952).**

80. **A Subject Index of the Society’s Journals, 1914-51, by R. S. R. Fitter (1952).**

89, 102, 105, 115. **The Moths of London and its Surroundings, by C. G. M. de Worms, 1953-7, Parts II-V, 2s. each.**

85, 91. **Post-war Progress in Nature Conservation in the London Area, by C. P. Castell (1953) and Correction and Additions (1954).**

86. **London Clay of Oxshott, by M. M. Brown and C. P. Castell (1953).**

93. **An Exposure of Chalk Rock near Westerham, Kent, by J. S. Hampton (1954).**

94. **Additions to the London Clay Fauna of Oxshott, Surrey, by M. M. Brown and C. P. Castell (1954).**

95. **The Butterflies of the North-West Kent Marshes with special reference to the 1953 Floods, by J. F. Burton (1954).**

96. **Notes on the Butterflies of Wimbledon Common, by A. W. Jones (1954).**

97. **Some Aspects of Dispersal and Succession of Plants in some Epping Forest Ponds, by C. H. Selby (1954).**

98. **The Bryophytes of Boxhill, by E. C. Wallace (1954).**

106. **The Arachnida of London, by T. H. Savory and A. E. Le Gros (1956).**

107. **The Distribution of the Grey Squirrel in the London Area (1953-6), by G. Beven (1956).**

108. **Vegetation History and Environmental Factors in the London Area, by F. Rose (1956).**

109. **Changes in the Bird Life of the London Area since 1900, by R. C. Homes (1957), 1s.**

110. **Changes in the Flora of the London Area since 1858, by J. E. Lousley (1957), 1s.**

111. **The Fishes of the London Area, by A. C. Wheeler (1957), 1s. 6d.**

112. **The Distribution of Grasshoppers and Allied Insects in the London Area, by R. M. Payne (1957), 1s.**

113. **Flies (Diptera) and their Relations with Plants, by L. Parmenter (1957), 1s.**

114. **The Gall Wasps of the London Area, by M. Niblett (1957), 1s.**

116. **The Flora of the City of London Bombed Sites, by A. W. Jones (1957), 1s. 6d.**

119, 120. **A Supplement to the Butterflies and Moths of London and its Surroundings (Parts I-II), by C. G. M. de Worms (1958-9), 3s. each.**

122. **A Contribution to the Flora of Central London, by D. H. Kent (1959), 2s.**

Postage on reprints and transactions: 1 copy 4d.—each additional copy 2d.
Prices to members: less 25%.

All publications of the Society may be obtained from the General Secretary.

Printed by F. J. Milner & Sons Ltd., Brentford and London

